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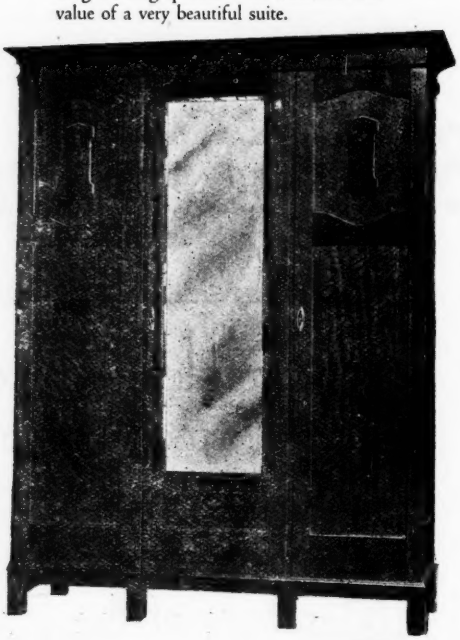

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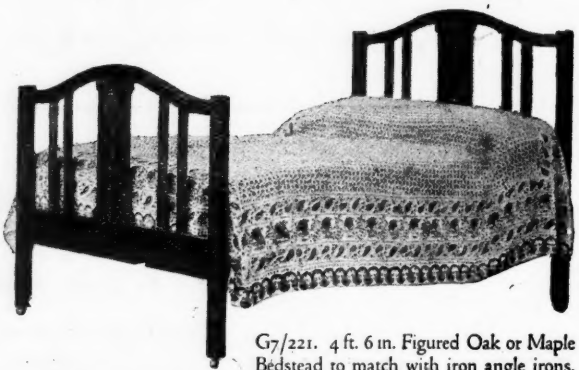

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MALARIA AT RABAUL.

By G. A. M. HEYDON, M.C., M.B., Ch.M., D.T.M.,

Officer in Charge, Commonwealth Health Laboratory, Rabaul, Territory of New Guinea.

Geography and Climate.

RABAUL, the capital and largest settlement of the mandated territory of New Guinea, is situated on the shores of Blanche Bay, which is formed by a hook-shaped promontory of high land which juts out from the northern coast of the Gazelle Peninsula. This peninsula forms the north-eastern sixth of the large island of New Britain.

Excluding natives the population of the town itself including Namanula is given at 1,350, of which it is estimated that 350 are whites and 1,000 Asiatics, chiefly Chinese. The number of natives resident in the town is said to be 1,500.

The native population of the surrounding district, less sparse than in many parts of the territory, is composed to the extent of about four-fifths of free local natives living in small villages of the type found in different varieties throughout this part of the Pacific. The rest of the native population consists of indentured labour, often from other parts of the territory.

The Gazelle Peninsula as well as New Britain generally consists of hilly country with in many places a coastal strip of flat land of varying width. The elevated land is cut into steep ridges and deep ravines and covered for the most part with tropical forest or dense bush.

In the Rabaul district the underlying rock is covered with a layer of volcanic ash and pumice, which renders the surface soil very absorbent of water.

While the town proper is on flat land adjoining the Bay, a minority of the white population lives at Namanula on the ridge about a mile to the north-east at an elevation of about one hundred and fifty metres (five hundred feet).

Rabaul is about 4.5° south of the equator. Owing to its sheltered situation in Blanche Bay it is hotter than most stations in the territory.

The average annual rainfall is given as 210 centimetres (83 inches), that for the territory generally being put at 254 to 292 centimetres (100 to 115 inches).

The period of the north-west trade from November to April is the wetter and slightly hotter part of the year. During that of the south-east trade from May to October dry spells of several weeks or even months may occur.

The seasonal variation of temperature is not great. The mean maximum daily shade temperature is given as 31.8° C. (89.4° F.) and the mean minimum as a little over 21.6° C. (71° F.), so that the

daily range is about ten degrees. The average relative humidity is given as 75%, varying from a little over 69% in October to 80% in April.

Previous Work on Malaria in New Britain.

The writer has not had access to a large reference library. Few records of earlier observations on malaria in New Britain during the German occupation or later have been obtainable at Rabaul.

The Anopheline Vectors.

Anopheles punctulatus occurs throughout the coastal parts of New Britain as well as in many, probably most, other parts of the territory. Specimens from Madang, the Sepik River and Manus in addition to a number of places on the coast of New Britain have been seen by the writer. Specimens of *Anopheles bancrofti* have also been seen from Madang, but neither this nor any other species of anopheline differing essentially from *Anopheles punctulatus* has so far been found in New Britain, with the exception of *Bironella gracilis*. The larvæ of this species were found abundantly in the Baining district of New Britain by Mr. G. F. Hill and the writer.

Anopheles punctulatus breeds in natural surface water generally, rain water puddles, more permanent pools and swamps, ditches and sluggish grass-grown streams or open wells where the water comes near the surface. It does not breed in artificial containers such as tanks, covered wells, roof gutters, empty tins and bottles, severed bamboo stems, nor with any frequency in broken cocoa-nut shells, large fallen leaves holding water or beached canoes. Tree holes and the water which collects at the bases of leaves such as banana and pandanus, are never used by this species. These statements are true generally even of empty tins *et cetera* which have long lain in the grass in favourable sites.

FIGURE I.
Roadside Pools. Breeding-place of *Anopheles punctulatus*, Dönitz (Variety near to the Typical Form).

On several occasions one or two larvæ were present in broken cocoa-nut shells; these were the only exceptions. The species prefers a fairly open situation. Larvæ do not occur in the pools and streams found in dense forests and deeply shaded gullies, even where villages are near.

Suitable breeding places occur most abundantly in the flat coastal land.

Around Rabaul, as already mentioned, the soil is very absorbent, the deepest and moistest gullies rarely contain surface water and the only natural water on the high land consists of a few tiny, rocky pools and of springs, some of which give rise to small streams which flow for short distances over the flat land. Even on the latter rain water pools within a couple of miles from Rabaul have never been observed to persist long enough to breed anopheles. Within this area most of the breeding places consist of swampy pools or ditches quite close to the shore where the sub-soil water comes very near the surface, though larvæ have been found in a few places where the flat land meets the hills and springs from the latter flow into the open. The importance of wells dug near Chinese gardens was pointed out by Mr. Wallace, until recently Sanitary Inspector in Rabaul. These are merely wide holes dug down to sufficient depth and uncovered. They are generally concealed by the surrounding scrub and easily overlooked.

In short, then, inadequate drainage along the shore line together with surface wells and one or two small streams near the foot of the hills are the sources of anopheles in Rabaul. To deal with them radically would involve no large undertakings. For about the last six months periodic oiling has been carried out by the Public Health Department and has caused a perceptible diminution in the numbers of adult anopheles. An important swampy patch near the Native Hospital has also been filled in, as well as a number of Chinese wells.

While the above remarks apply to *Anopheles punctulatus* generally, it has recently appeared from the examination of material sent to the Australian Institute of Tropical Medicine that two varieties of *Anopheles punctulatus* occur near Rabaul and in other parts of New Britain. These show differences in both the larval and adult stages. One variety is *Anopheles punctulatus*, Dönitz, variety *moluccensis*, Swellengrebel, agreeing closely with Swellengrebel's descriptions and figures, and the other is described as near to, but not identical with *Anopheles punctulatus*, Dönitz, typical form. They will be referred to as the moluccensis variety and the "D. variety."

Definite differences in the habits of these two varieties exist. The "D. variety" is found chiefly in temporary puddles and shallow pools of rain water, often muddy but not foul, such as occur at road sides, in hoof marks or in local depressions of the ground in localities where the soil is not too

porous to retain such water. It has not been found in pools in any kind of relation with salt water. The moluccensis variety occurs in more permanent pools and swamps often of less pure water, in open wells, if they come near the surface, and in depressions generally which tap the subsoil water. It is often found within a few feet of the shore, in pools and swamps which may vary in level with the tides or even show channels of periodic communication with the sea. Such waters, however, consist mainly of soakage from the land and larvæ have not been found in any which were decidedly salt to the taste, that is which contained more than about one part of sea water in seven. This variety has been observed living and apparently thriving in a pool which, though not salt, was completely emptied at each low tide for an hour or more, the rotting leaves on the bottom remaining wet during this interval. Young larvæ of the two varieties were tested as to their tolerance of sea water and it was found that while both died within eighteen hours in a dilution of one in two, those of the moluccensis variety all survived one in four for thirty-six hours at least and some of them for seventy-two hours. On the other hand all of the "D. variety" died within thirty-six hours in a one in four dilution.

All the adults caught in Rabaul itself which have been identified, have belonged to the moluccensis variety, as have the specimens obtained through the courtesy of medical officers of the Territory Administration from Madang and Manus. Probably the moluccensis variety is the predominant one in New Britain along the coastal strip, especially where swamps exist, while the other is relatively more numerous on higher land and perhaps also in the wet season.

FIGURE II.
Foreshore Drains, Rabaul. Breeding-place of *Anopheles punctulatus*, Dönitz, var. *moluccensis*, Swellengrebel.

The average duration in nature of the larval stage of the "D. variety" appears to be somewhat shorter than that of the moluccensis variety, an advantage, of course, in the temporary breeding places of the former. The shortest period from oviposition to imago observed with certainty in this variety was nine days, but it is doubtful if this is the minimum.

In the laboratory observations described in this paper specimens of the moluccensis variety were infected with *Plasmodium vivax* and both varieties with *Laverania malariæ*. In the case of the specimens caught in houses *et cetera* and dissected, the variety was not ascertained, but it is probable that the majority were of the moluccensis variety.

The habits of the adults which are very imperfectly known, are so far as has been observed similar in the two varieties. Both frequent houses, where the females bite throughout the night and can be found during the daytime, most easily in the small huts and rooms of natives which are often dark, and at night full of humanity. They rest on the walls, often near the ground, on the undersides of beds, on wooden floors near the walls and in sheltered and usually dark situations generally.

In places visited by the writer this species never bites by day or even at dawn or early evening, but it is said to do so in localities where it is very numerous.

Breeding occurs throughout the year, the adults becoming more numerous after the onset of the wet season and scarcer as the dry advances.

They are not numerous in Rabaul. In the early part of 1922 it was always possible in the course of an evening spent in almost any bungalow in the town to catch from two or three up to a dozen specimens, while resting gorged females could be found in small numbers by careful searching in the morning in the sleeping quarters of natives. At present they are quite scarce even for the dry season owing, as already mentioned, to anti-larval measures.

As regards range of flight nothing certain has been ascertained.

How far *Anopheles punctulatus* or any of its varieties has been directly proved to be a vector in other parts of the world is a matter of uncertainty to the writer.

The best evidence as to the importance as a vector of any species of anopheles is generally considered to be obtained from the dissection of specimens captured in their natural haunts. This method has the disadvantages, however, that the species of parasite found is often unascertainable and that the percentage of the same species found infected varies enormously with the exact place and conditions of capture.

As a species may be an important vector for one species of parasite and not for another, the former consideration may be of importance. Observations on mosquitoes infected in the laboratory are free from this difficulty, but are subject to the greater one that it appears to be unsafe to draw too definite inferences from the degree of infectivity found under given conditions in captivity to that obtaining in Nature.

The following observations on *Anopheles punctulatus* as a malaria vector have been made at Rabaul at various times during 1922 and the present year.

Laboratory Experiments.

Artificial Infections.

Plasmodium vivax and *Laverania malariæ* were found capable of completing their development in a large percentage of *Anopheles punctulatus* reared from captured larvæ and pupæ and fed on blood containing the gametocytes.

In the two experiments summarized below the mosquitoes after emergence were kept in wooden boxes of about eighty-five thousand cubic centimetres (three cubic feet) capacity in the dark.

They were kept at temperatures varying from about 30° C. (86° F.) during the hottest part of the day to about 23° C. (73° or 74° F.) in the coolest part of the night. The humidity in the boxes was much above that of the open air. Males were always present in the boxes, at any rate until some days after the blood feeds. From the day before the first occasion on which they were offered infected blood, until twenty-four hours after the last no other food was given; at all other times they were fed continuously on banana only.

A few experiments preceding the two described, in which, however, the mosquitoes were kept under different conditions, failed from incompletely ascertained causes and these two are those which resulted in the largest proportion of infected mosquitoes in the case of each species of parasite. In addition to one or more examinations of the blood of the carrier before the mosquitoes were fed, a number of thin films were made and 0.1 to 0.15 cubic millimetres of blood examined from each day of feeding in order to exclude as far as possible the existence of double infections.

The carrier used was an adult native whose blood contained *Plasmodium vivax,* asexual and sexual forms, and no other parasites. Of the mosquitoes all of the moluccensis variety which fed on this carrier and were later dissected, had fed on November 6, 1922, and had had additional opporutnities to feed on November 7, 9 and 10, 1922. Eight were examined between November 14 and 16, inclusive; in three of them oocysts were found in the midgut and in none was there infection of the salivary glands.

Three out of seven examined between November 21 and 23, inclusive, contained sporozoites in the salivary glands. The total number infected was six out of fifteen.

One lot of mosquitoes dissected, all of the moluccensis variety, had fed on a crescent-carrying native child on one or more of the following days, February 6, 8, 9, 10, 11 and 12, 1923. On none of these days were more than two hundred crescents present per cubic millimetre.

Dissections as follows:

On February 17, four were examined and oocysts were found in the midgut in every case; the salivary glands were infected in none.

On February 18 and 19 three were examined—all showed infected glands and one had nine oocysts in the midgut.

The total number infected was seven out of seven.

Some further *Anopheles punctulatus* of the "D. variety" were fed on the same carrier at about the same time. Those which did not feed, were not separated from the others and of seven dissected later the proportion which had fed is unknown. Two out of the seven showed salivary gland infection.

A single experiment, in which feeding took place on not more than two occasions on a native child infected with *Plasmodium malariæ* resulted in ten out of eighteen mosquitoes showing infections. Owing, however, to the period within which the salivary glands showed infection, namely ten days, being shorter than the minimum which *Plasmodium malariæ* is said to require in other anophelines at its optimum temperature, it is thought that gametocytes of *Plasmodium vivax* may also have been present in this case, though no benign tertian parasites whatever could be discovered in the blood.

It is hoped to repeat the observations with another carrier of *Plasmodium malariæ.* It would seem that such observations ought always to be made with more than one carrier in order to diminish the probability of error from undetected double infections. Swellengrebel has suggested feeding experiments as a diagnostic measure in cases where parasites cannot be found. He must, therefore, be of opinion that anopheles can be infected when parasites are so scarce as to be discoverable only with great difficulty. Darling, however, inferred from his experiments in Panama that blood containing less than twelve gametocytes per cubic millimetre is not infective. But different species of anopheles and of parasite may well differ in this respect.

Dissections of Mosquitoes Caught in Houses.

In most cases the mosquitoes were kept for a few days before dissection. They were two hundred and thirty-seven in all. Of these sixty-three were caught at the White Hospital, Namanula, early in 1922, and a further thirty-eight at different times in the writer's bungalow. The majority of these one hundred and one specimens were caught at night while attempting to bite. None showed infection. The examination of the salivary glands was omitted or totally failed in twenty of these and of the midguts in nine.

The remaining one hundred and thirty-six were caught in native quarters or village huts, chiefly while resting during the day. The greater number was caught within ten miles of Rabaul and chiefly during the wet season. Of these one hundred and thirty-six, eight showed oocysts in the midgut large enough to be detected with a low power and eight showed sporozoites in the salivary glands. The salivary glands were completely missed in eleven and the midguts in eight.

The percentages work out as follows:

Total sporozoite rate, 8 out of 206 ..	3.9%
Total percentage showing oocysts, 8 out of 220	3.6%
Sporozoite rate in those caught in native quarters, 8 out of 125.. ..	6.4%
Percentage showing oocysts in those caught in native quarters, 8 out of 128	6.2%

It is not claimed that these percentages afford any indication of the true average rates, as, apart from the smallness of the numbers, there was no attempt at random sampling.

In some of the mosquitoes infected in the laboratory and showing sporozoites in the salivary glands, as well as in one or two of those caught in huts, the thoracic muscles and body fluids were examined in the fresh condition for sporozoites without result.

It would seem, however, that if anything like the general distribution of sporozoites throughout the body described by Mühlens in some specimens of *Anopheles maculipennis* were present, it would not be easy to detect, by this method at any rate, except in insects much more heavily infected than *Anopheles punctulatus* appears commonly to be. Some concentration of sporozoites in the salivary glands must certainly occur in *Anopheles punctulatus*.

Malaria in Man.

Malaria of epidemic type has not been met with nor has any cerebral or other really pernicious case been seen (apart from blackwater, which is not here discussed).

All three species of malarial parasites are endemic at Rabaul. The writer has found quartan parasites in the blood of native children in several villages close to the town, as well as in the Duke of York Islands. This form appears to have been observed in New Britain by German investigators, but in what districts the writer is unaware.

An estimate of the amount of endemic malaria in a locality is most readily obtained by the examination of the local non-immune population, which includes native and other children who have been born and bred in the place, as well as white adults who have never visited other malarious regions and have taken no quinine. Of these classes natives indigenous to the place are often the most numerous and accessible; as the spleen and parasite rates of such have been determined in many parts of the world, standards of comparison are afforded. The rates in these natives should be taken not only in children, but at all ages, because although the absolute rates in young children are roughly direct measures of the "malariousness," the form which the curves take as age and acquired immunity increase, gives further valuable information. The more malarious the place, the earlier is the age at which maximum rates are found, and the higher they are at this age and at ages below it. At later ages the less malarious place may show higher rates and it is said that a low spleen rate in adult natives means either very little malaria or a great deal of it, a high degree of immunity having been acquired in the latter case. In general the parasite rate rises to an earlier maximum and falls sooner than does the rate for enlarged spleens. When rates at similar ages are compared in different classes or races in the same place, very different results may be got, quite apart from quinine or deliberate protective measures. They would still often be different even if in each class the rate of new infections were the same, for the reason that the general standard of life, quality and abundance of food *et cetera* have a great effect on the duration of attacks and on the frequency with which relapses occur.

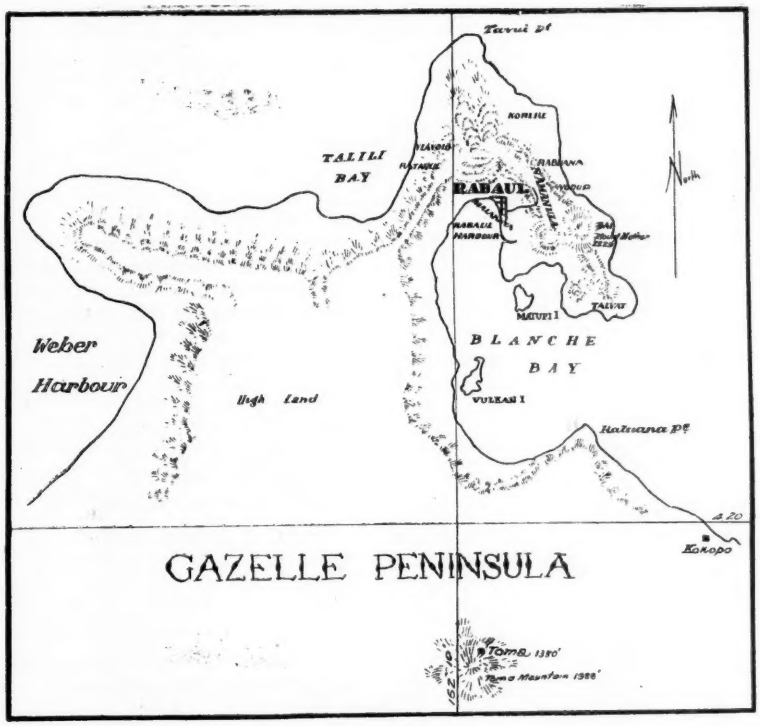

FIGURE III.
Map of Rabaul District. Scale: 4½ Miles to the Inch.

Turning then to the consideration of that part of the Rabaul population which has spent its life in the place, two classes are available, local natives and Chinese children.

Local Natives.

The villages near Rabaul show great differences, but the figures collected from a number of them taken together, reveal a moderate average amount of endemic malaria. Benign tertian parasites are more common than subtertian, while quartan is common in some villages.

The spleen rates at different ages in natives of villages within five miles of Rabaul (most of them within three miles) are given below and shown in

TABLE I.

Physical Condition.	Age Groups (Years).				
	0—2	3—6	7—11	12—17	Over 17
Number of examinations	382	300	347	116	939
Spleen palpable	30	55	81	56	213
	7.8%	18.3%	23.3%	48.3%	22.7%

TABLE II.

Physical Condition.	Age Groups (Years).				
	0—2	3—6	7—11	12—17	Over 17
Number of examinations	176	170	91	52	107
Spleen palpable	26	50	36	23	20
	14.8%	29.4%	39.5%	44.2%	18.7%
Parasites found	43	55	34	19	7
	24.4%	32.3%	37.4%	36.5%	6.5%

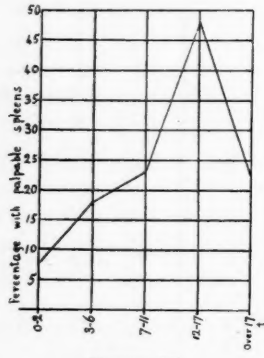

FIGURE IV.
Spleen Rates in 2,084 Natives of Villages near Rabaul.

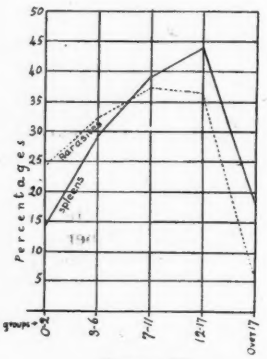

FIGURE V.
Parasite and Spleen Rates in 596 Natives of Villages near Rabaul.

Figure IV. The total number of examinations at different times was 2,084, but the number of different individuals examined was considerably less.

It will be seen that both the form of the curve and the natural percentages in children are of the sort characteristic of a moderately malarious locality.

The villages from which these figures were obtained are in the following localities, the positions of which are roughly indicated in the accompanying map (Figure III.): Malakuna, Matupi Island, Talvat, Bai, Nodup, Rabuana, Korere, Vlavalo, Ratavul.

The huts belonging to what is in name a single village, are often much scattered, so that a village of, say, a hundred inhabitants may be spread over several hundred yards in small groups of a few huts each.

In these figures and in others given in this paper considerable distortion has been caused by errors in judging ages and also by inequalities in the proportions of persons of different ages who were secured for examination at different villages and at different times. The latter source of error applies especially to the adult age group, "over 17," while both have been operative in the group 12 to 17. Spleen rates were taken standing, or in the case of infants while held by the mother. The age groups chosen, given as "0—2," "3—6," "7—11," "12—17" and "over 17," mean respectively the first three years of life, the next four, the next five, the next six and the remainder. Most of the adult natives examined were young and nearly all were males.

Further figures of both the spleen and parasite rates in a smaller number of natives, namely 596, from some of the same villages are shown in Figures IV. and V. These included a higher proportion of the more malarious villages.

In the 158 cases in this group in which parasites were found, *Plasmodium vivax* was present ninety-eight times, *Laverania malariæ* forty-three and *Plasmodium malariæ* nineteen, while eleven were doubtful. Double infections were noted in thirteen patients, chiefly *Plasmodium vivax* with *Laverania malariæ*. Thin films only were used in obtaining the parasite rates here given and the amount of blood examined averaged between 0.015 and 0.02 cubic millimetres.

In the districts of Talvat, Bai, Nodup, Rabuana and Korere there were much lower spleen and parasite rates than in the villages on the shore of Blanche Bay (at Malakuna and Matupi Island). On the coast on which the former are situated, the land rises rapidly from the beach and there is little flat land.

These and other figures for natives were collected from different places at various times of the year, both before and after the introduction of anti-

anopheline measures by the Public Health Department, in such a way that unfortunately the nature of the seasonal variation in the rates is not apparent with any certainty. However, they may lend some support to such figures for white men as have been available and to the writer's general impression which is that benign tertian rises almost to its maximum about the middle of the wet season, while that of subtertian is not attained until the end of the wet season or early in the dry. The difference between the most and least malarious villages is much greater than the seasonal variation in any one village.

Chinese Children.

Most of the Chinese children in Rabaul have lived there all their lives, Chinatown lying about half a mile north of the administrative centre of Rabaul and about one-third of a mile from the shore. Eighty Chinese children of all ages up to fourteen were examined in January of this year. Only three had palpable spleens and malarial parasites were found in three, of which all were *Plasmodium vivax*. These are strikingly low figures and probably related in part to the situation of Chinatown, within several hundred yards of which, in spite of its low lying position, Anopheline breeding places are scarce. But the difference in the standard and mode of life is probably responsible for the greater part of the relative immunity of Chinese children compared with those of natives. The Chinese in Rabaul live well and more or less effective mosquito nets are commonly used. The children are seldom given any quinine.

White Men and Natives.

As regards whites many difficulties arise in the consideration of statistics of malarial morbidity, especially when the figures are small and arrivals from other stations frequent.

Some figures of the Public Health Department of the Administration in Rabaul and some German figures which have been available, indicate, however, as regards the matter of seasonal prevalence, that in whites maxima occur in January to February and in May to June, with the minimum in September to October. As regards the May to June crest, its height may possibly be increased by the onset of the cooler weather disposing to relapses.

The figures of routine diagnostic blood film examinations of whites and Asiatics in this laboratory, although small and impaired by discontinuities, also show a minimum towards the end of the dry season and a maximum about May; they also show that the latter is due to subtertian infections. In the eighteen months ended on June 30 of this year malarial parasites were found in sixty-two of these examinations (chiefly whites). *Plasmodium vivax* was found twenty-three times, *Laverania malariæ* forty-two times and the quartan parasite once; in four cases double infections were noticed. The proportion of subtertian to benign tertian is, of course, higher than the true ratio, as the former cases are more likely to come under notice.

Three instances have occurred of newly arrived whites who could not previously have been infected, but succumbed to attacks of malaria within four weeks of arrival in Rabaul. These infections were diagnosed microscopically; two were benign tertian and one subtertian. In a couple of less certainly authenticated cases there had been no attack within the first year of residence in Rabaul, although not more than a dozen small doses of quinine altogether had been taken. These extremes are, of course, quite consistent with the laws of chance. Apparently the majority of those living on the flat in Rabaul are infected during their first wet season if not before, although quinine takers may, of course, show no signs of it. Namanula is definitely less malarious.

Sundry other observations on natives, other than villagers near Rabaul, may now be referred to.

The neighbourhood of Toma, about fourteen miles south from Rabaul, is of some interest. Toma itself consists of a plantation and a hotel, the latter used as a holiday and convalescent resort. It is about 412 metres (1,350 feet) above the sea, the nearest point of which is distant about six miles. It is cooler and wetter than the coastal district.

The spleen rates in the children in December, 1922, in a number of villages in the district, most of them a few miles to the north and west of Toma, are given in Table III.

These villages are at lower levels than the Toma Hotel, down to about 183 metres (600 feet); none are within several miles of the sea.

The number of persons examined and that of persons with palpably enlarged spleens at a mission station and a plantation in the immediate neighbourhood of Toma, are set out in Table IV.

The village spleen rates are very low and are correlated with the scarcity of anopheles breeding places near these villages and in the neighbouring country generally. The deep ravines unlike those near Rabaul usually contain clear, deeply shaded streams. These never contain anopheles. Mr. G. F. Hill and the writer were unable to find a single anopheline larva or adult near Toma. A few pools formed in the marginal drains of government-made

TABLE III.

Physical Condition.	Age Groups (Years).				
	0—2	3—6	7—11	12—17	Over 17
Number of examinations	24	73	101	10	3
Spleen palpable	0	0	1	1	0

TABLE IV.

Physical Condition.	Age Groups (Years).				
	0—2	3—6	7—11	12—17	Over 17
Number of examinations	1	3	15	5	46
Spleen palpable	0	0	6	2	12

roads were the only surface water existing which seemed at all suitable to *Anopheles punctulatus*.

It will be noted that there was a larger proportion of enlarged spleens among the persons in the plantation and belonging to the mission. It has been observed in other districts that the spleen rates of natives living at plantations and missions are sometimes higher than those of natives in the neighbouring villages. While boys on plantations commonly come from other parts of the territory under a three or a two years' contract, at mission stations a larger proportion of the adults and especially children have usually been born in the locality. The probable reasons for this increase of malaria at some settlements are the aggregation of larger numbers in smaller areas and the fact that some of civilization's dealings with the bush often tend to increase the number of breeding places highly favourable to *Anopheles punctulatus*, especially the "D. variety." The formation of a white station near low-lying coastal swamps or pools due to depressions below the level of the subsoil water usually leads sooner or later to partial drainage, but on the other hand a settlement a little inland or in a place where previously only a few pools existed in dense bush little favoured by *Anopheles punctulatus*, will often lead to an increase in the numbers of these mosquitoes. Clearing and path making often tend to the formation of open rain water pools and road-side puddles by interfering with natural slopes, compacting the surface soil and reducing plant transpiration. Ponds or surface wells may be constructed, one of which may contain more anopheles larvæ than could previously have been found for miles around. It may be mentioned that natives' notions of making a water supply are confined to the scraping of evanescent holes on the beach for the tapping of subsoil water or to catching a little water by leaning a cut bamboo against a tree trunk. Villagers will often be found to carry water from a distance or to depend mainly on green cocoa-nuts. During a later visit to Toma the writer was again unable to find any anopheles, except at the hotel itself, where adults were abundant and were found to be coming from a small pond which had been dug in the open; they were of the "D. variety." This observation, besides illustrating the previous remarks, shows that the scarcity of anopheles in this neighbourhood, shared by many inland districts in New Britain, is due to lack of suitable breeding places and not to climate or elevation, at any rate as regards this variety of *Anopheles punctulatus*.

The following are figures for native labour in Rabaul, little of which is drawn from local boys.

In April, 1922, out of three hundred and eighty-seven examined 47.5% had palpable spleens and of seventy-six examined for parasites seven or 9.2% harboured malaria parasites. Five of these were *Plasmodium vivax* and two *Laverania malariæ*. The inferences which can safely be drawn from such adult rates in non-local natives, are still a matter of some doubt to the writer and will not be discussed here. The spleen rate in Rabaul police boys taken in July of this year by the Public Health Department was less than 20%.

A few additional localities may be mentioned.

The Duke of York Islands, a group of small low-lying islands twenty miles east of Rabaul, the largest about four miles across, are somewhat highly malarious. Figures for villages on the main Duke of York Island and the island of Mioko, taken in July, 1922 are given in Table V.

Of the parasites found thirteen were *Plasmodium vivax*, eight *Laverania malariæ* and four were *Plasmodium malariæ*. There was one double infection.

TABLE V.

Physical Condition.	Age Groups (Years).				
	0—2	3—6	7—11	12—17	Over 17
Number of examinations	93	78	87	16	76
Spleen palpable	22	10	52	9	8
	24%	51%	60%	56%	10%
Number examined for parasites	33	10	17	1	0
Parasites found	9	5	9	1	0
	27%	50%	53%	—	—

TABLE VI.
SPLEEN RATES IN NATIVE VILLAGES—BAINING.

Physical Condition.	Age Groups (Years).				
	0—2	3—6	7—11	12—17	Over 17
Number of examinations	54	6	14	7	143
Spleen palpable	1	2	7	6	63

TABLE VII.
SPLEEN RATES IN NATIVES AT PLANTATIONS AND MISSIONS—BAINING.

Physical Condition.	Age Groups (Years).				
	0—2	3—6	7—11	12—17	Over 17
Number of examinations	3	6	37	41	233
Spleen palpable	1	3	22	29	116

Spleen rates taken in the Baining district, towards the north-west end of the Gazelle Peninsula in June, 1922, at a number of villages, plantations and missions both on the coast and at short distances inland, are given in Tables VI. and VII.

Kokopo, formerly Herbertshöhe and at one time the capital, on the coast eleven miles south-east from Rabaul, appeared from the few figures collected in native children at a mission station there to be less malarious than Rabaul.

From time to time at Rabaul forms of malarial parasites differing more or less from the well-recognized types have been encountered.

Parasites resembling the younger forms of *Plasmodium tenue* have not been rare; one case occurred in which there were more advanced forms of this kind, as was pointed out by Dr. R. W. Cilento to whom various films had been sent. No fully grown asexual forms or gametocytes were seen in this case. These forms appear to the writer to be variations of *Laverania malariæ*.

One film seen from the Duke of York Islands contained forms resembling those which have been described as *Plasmodium vivax*, variety *minuta*.

The view popularly held that malaria in the territory is of importance chiefly to whites is, of course, quite a mistake. The chief sufferers are native infants. A native baby is a new arrival in the country and unprotected by acquired resistance to malaria. When it is dangerously ill without signs of the more obvoius diseases, the cause remains obscure or is attributed by the village to a ghost in the night. Malaria is certainly an important cause of the high infantile mortality in the native. Naturally few infantile mortality figures are yet available in the territory. It is, however, of interest to note that the average size of the family, as shown by figures collected by the present District Officer for Kokopo, is higher in the neighbourhood of Toma than in villages on the adjacent parts of the coast, peopled by the same tribe.

All the work on the identification of anopheles and their varieties referred to in this paper has been done by Mr. G. F. Hill who, the writer believes, is publishing an account of these and other Australian forms.

Reports of Cases.

IRREDUCIBLE INTUSSUSCEPTION IN CHILDREN: SUCCESSFUL RESECTION IN TWO CASES, ONE BY LATERAL ANASTOMOSIS AND ONE BY MAUNSELL'S OPERATION.

BY HAROLD RISCHBIETH, M.A., M.D., B.Ch. (Cambridge), F.R.C.S. (England),
Honorary Surgeon to the Children's Hospital, Adelaide.

THESE two cases present such unusual features that I think that they should be recorded.

Case I.

E.P., aged four years and four months, had been ill for ten days before admission to hospital. At first there was swelling of the legs. This disappeared two days before admission. But the patient had had no natural motion for the ten days and enemata had yielded no satisfactory result in that time. During several days he had vomited all food immediately.

He had had broncho-pneumonia at the age of six months, whooping cough at the age of twelve months and measles at the age of one year and six months.

On admission the patient complained of abdominal pain. The abdomen was distended, but moved on respiration. There was no rigidity. There was dulness in both flanks, which shifted. No tumour could be felt.

The general condition was one of shock verging on collapse. There had been no passage of blood *per rectum*. Intestinal obstruction of uncertain origin was all that I was able to determine as to diagnosis.

The patient was anæsthetized. Nothing in the shape of a tumour could be felt. The usual median incision was made. The caecum was immediately felt to be collapsed, indicating a small gut obstruction. Thereafter a sausage-like tumour was felt in the pelvis. On further examination this proved to be an enteric intussusception about ninety centimetres above the ileo-caecal valve. Attempts

at reduction failed. Persistence immediately resulted in the tearing of the peritoneal coat. The ensheathing layer was of a plum-blue colour and contained several gangrenous patches. Resection was thus inevitable. This had of necessity to be performed in the ordinary manner with lateral anastomosis. I attempted tentatively to increase the intussusception so that normal intestine could be obtained as an ensheathing layer in order to perform the Maunsell operation. This the gangrenous condition of the ensheathing layer, as it stood, rendered out of the question. But this could not be done, as examination of the specimen after removal proved, owing to adhesions between the entering and returning and the returning and ensheathing layers. With the usual after-treatment the patient made an uninterrupted recovery, except that the lower fourth of the wound broke down superficially. It healed without trouble and the patient went home on the twenty-fourth day after the operation.

The features about this case that seem unusual, are as follows. In the first place the mode of onset, as shown by the history, was remarkable. The clinical picture was not typical of intussusception, probably because the intussusceptum was enteric, an unusual type as far as I have seen or read in young children. All that was justifiable in diagnosis was intestinal obstruction of uncertain cause.

The fact that this child had been able to withstand an abdominal catastrophe for ten days or that this catastrophe was subacute, together with his age (four years and four months, considerably greater than that of many of these patients) probably accounts for the successful result after operation. Examination of the specimen after removal revealed no polypus or other obvious cause of the intussusception.

Case II.

The second case was one of successful resection by the Maunsell method of an ordinary irreducible caecal-ileocaecal intussusception in a boy, aged four years. This case was described by me in THE MEDICAL JOURNAL OF AUSTRALIA, February 7, 1920, page 123. No further description of that is contemplated. But the subsequent history of the patient was so remarkable that the history should be recorded.

The boy left the hospital sixteen days after the operation apparently well. He was brought back about six months later with the complaint of abdominal pain which he had then had intermittently for two weeks. There had been no vomiting and the bowels had been opened every day. His appearance was healthy and his general condition good.

The abdomen was examined and a hard, irregular mass was felt below and to the right of the scar of the operation. The mass was not tender, did not move on respiration and was immovable by palpation. It was dull on percussion, but the abdomen was resonant elsewhere.

It was thought that the mass might be one of fæcal accumulation as the result of stricture at the suture line of the resection or alternatively that it was a mass of omentum adhesions. Enemata produced no diminution of the mass. Exploratory laparotomy revealed a large, infiltrating mass originating apparently in the right kidney and extending to the left beyond the middle line. There was a nodular mass at the lower pole of the right kidney. Removal was impossible. The wound was closed. There was a considerable amount of free fluid in the peritoneal cavity; the mesenteric glands were enlarged, hard and nodular; one was removed for microscopical examination.

The report of the Honorary Pathologist on this specimen was that it was a lympho-sarcoma. Death occurred nine and a half months after the original operation of resection for intussusception and three and a half months after his return to hospital with the abdominal tumour. There was evidence of secondary growth in the form of nodules in the xiphisternal region during the last few weeks of life. On the day of death there were convulsions with conjugate deviation of the head and eyes to the right, twitchings of the right side of the face and right arm and hand.

Post mortem a large infiltrating mass was removed invading the right kidney and the intestine about the line of suture, that is at the junction of the ileum and colon, the wall of which was completely invaded by it, but the lumen of which was unaffected, so that there was no obstruction. The growth was examined by the Pathologist of the South Australian Government Laboratory, Dr. L. B. Bull, and was found to be a retro-peritoneal sarcoma of spindle-celled type.

I can but suppose that this association of intussusception with the renal malignant disease must be very rare. The fate of this unfortunate child, having recovered after resection of an almost gangrenous intussusception, only to succumb almost immediately to malignant disease will afford the philosophical yet another instance of the fact that truly "there is a destiny that shapes our ends, rough hew them as we may."

I wish to refer to the choice of operation in resection in irreducible intussusception in young children and to the advantages of Maunsell's method (whenever this is possible) over the ordinary type of resection with lateral anastomosis. The time required is much less, the traction on the peritoneum and consequent shock are much less and the operative skill and experience necessary are much less. Resection of intestine in young children and in adults ought to be grouped as dissimilar undertakings. The former stand the shock of abdominal manipulation so very badly compared with the latter. I am not presuming to offer these remarks to the operating surgeon, but to the man who may be called upon to deal with irreducible intussusception without much experience of the operative treatment of this condition in children. There are, however, cases in which Maunsell's method of resection cannot be done, as will be seen in the first case described above.

Reviews.

PROPHYLAXIS OF VENEREAL DISEASE.

IN his book, "Venereal Diseases in the American Expeditionary Forces," Dr. George Walker records the experiences of those connected with the American Urological Department in the control and prevention of venereal disease.[1] The all-important subject of prophylaxis is described in minute detail and the results obtained are illustrated by graphs. Statistics from which the graphs have been plotted, are given.

The splendid report by Dr. Walker proves definitely what may be done by prophylaxis under proper discipline and careful medical supervision coupled with control of alcohol as a potent factor. Slipshod methods proved totally inefficient as they always do.

The conditions in the licensed houses are described and severe criticism is justly levelled at the indifferent and totally inadequate examination of the women in such houses. A short account is given of venereal diseases in the British and French armies in France.

The most prominent feature of this book is the proof of the efficiency of prophylaxis soon after exposure. The fact that prophylaxis was responsible for reducing the rate of infection in the American Expeditionary Forces from two hundred and forty per thousand per annum amongst the white troops and six hundred and twenty-five per thousand per annum amongst the coloured troops to an infection rate of thirty-one per thousand, speaks for itself.

This author has included in his book all reports and correspondence relevant to the question and has laid stress on the sympathetic attitude of the American Commander-in-Chief, General Pershing, and to his staunch and unwavering support even in the face of opposition from the French Headquarters' staff.

The perusal of this splendid book by our legislators and those interested in the subject is recommended, for it brings out prominently what has been accomplished elsewhere and may be accomplished in Australia in the control and prevention of venereal disease.

[1] "Venereal Disease in the American Expeditionary Forces," by George Walker, M.D.; 1922. Baltimore: Medical Standard Book Company; Demy 8vo., pp. xxiii. + 237. Price: $2.50.

Australasian Medical Congress (British Medical Association).

(*Continued from page* 622.)

SECTION VI.—OPHTHALMOLOGY.

Prophylaxis in Ophthalmic Work.

DR. D. D. PATON, the PRESIDENT, after acknowledging the honour done to Western Australia in appointing him to the chair of the Section, delivered an address touching on some aspects of prevention in ophthalmic work, reviewing the changes since Pasteur. He emphasized the work of Elschnig and Lindner and pointed out that it was not necessary to differentiate between the pneumococcus and the various streptococci. He held it to be advisable to make cultures for the detection of staphylococci not only from the conjunctival secretion, but also from epithelial scrapings. He counselled a routine examination for all major operations, by smear and blood agar cultures. For infections and corneal ulcers Darier's method of twenty cubic centimetre doses of serum given orally was still being used and Jacovides was using autoserum from blisters in serpigenous ulcers, while Müller advised intramuscular injections of milk which had been boiled for four minutes. The risk of anaphylactic shock seemed small. The mechanism of the protection was unsettled.

Dr. Paton urged the extended use of conjunctival flaps to cover over open wounds or the complete covering in of the cornea when wounds were extensive. He pointed out that the slit lamp had shown that transient forms of sympathetic ophthalmitis occurred which resolved entirely under treatment. He calculated that eliminating the three preventible diseases, trachoma, syphilis and *ophthalmia neonatorum*, out-patients would be reduced by 12% and in-patients by 30% in the Perth hospitals.

He detailed Lindner's experiments on the changing of the aqueous fluid after the injection of uranin. The "Nitra" slip lamp was used to detect the drug. Discussing the bearing of these researches on primary glaucoma, the speaker considered the "increased inflow" hypothesis to be worthy of close attention and the general health of the patient to be of paramount importance in the prevention of glaucoma.

As to operative treatment of glaucoma, Dr. Paton stated that the Vienna school was in favour of a cyclo-dialysis with iridectomy which had thus replaced trephining.

He concluded by emphasizing the need of a general medical training and large practical experience and a doctorate based on research as being the best training for an ophthalmologist. Finally he suggested the foundation of an Australian ophthalmological society with a central library of current ophthalmological literature.

Trachoma.

Dr. D. D. Paton opened a discussion on trachoma. He emphasized the need for a wide dissemination of the elementary principles of hygiene and early treatment. He pointed out that Americans had suggested a connexion between tuberculosis and trachoma and he had noted an association of carbo-hydrate intolerance and some corneal conditions. At his clinic at the Children's Hospital 8% of the patients admitted for the first time were suffering from trachoma, while only 2.3% of patients of all ages in private practice were similarly affected. Referring to Prowazek's inclusion bodies, the latest work seemed to indicate that they were organisms and Lindner distinguished the true bodies from those found in spring catarrh and *epitheliosis desquamativa*. This observer held that non-gonococcal *blenorrhœa neonatorum* was trachomatous and that there was a trachoma of the genital passages. Vaccine treatment, however, in the hands of Cuénod and Blaizot had been of doubtful value.

In speaking of the trachoma follicle, he referred to the treatment by applications to the surface (drops) and treatment by stronger applications such as mercuric oxycyanide, massage and expression. Rudas had claimed a considerable shortening of the period of treatment by the use of iodic acid. Carbon dioxide snow, excision of the tarsus and combined excision were fully discussed. He made a strong plea for the compulsory notification of trachoma.

DR. J. CAMPBELL DOUGLAS (Newcastle) said that while the fresh evidence in favour of cell inclusion bodies was stimulating and suggestive, it was not very convincing. Further work in this direction was required and might be carried out by Australian ophthalmic surgeons. The differences in the clinical appearances between trachoma on the one hand and *ophthalmia neonatorum* and gonorrhœal infections of the conjunctiva on the other were against ætiological relation of the two diseases. Its relation to non-gonorrhœal *ophthalmia neonatorum* was discounted by the work of Browning, at Moorfields Hospital, who had found that about 90% of these cases were due to the pneumococcus.

He desired to say something on the standard of cure in trachoma. Many of the patients who had attended for long periods at Moorfields Hospital, had shown little evidence of disease beyond photophobia. McCallam, with all his experience, had expressed to the writer his difficulty in deciding in certain cases whether or not a cure had been complete. The speaker suggested as a standard of cure the following conditions: (i.) There should be freedom from discharge, (ii.) the conjunctiva should be pale and smooth, free from redness and injection and dilated vessels, (iii.) hypertrophied papillæ and follicles should have completely disappeared or should have been replaced by cicatricial tissue, (iv.) pannus should have completely retrogressed or been replaced by scar tissue, (v.) photophobia, lachrymation, pain and discomfort should have disappeared.

SIR JAMES BARRETT (Melbourne) stated that he used operative measures only in advanced cases and tarsectomy, canthotomy and peritomy.

DR. LEONARD MITCHELL (Melbourne) stated that he had given up carbon dioxide snow as patients would not put up with the pain.

DR. E. TEMPLE SMITH (Sydney) recommended nitrate of silver and later operative treatment only in advanced cases.

DR. J. CAMPBELL DOUGLAS doubted the association of gonorrhœa and trachoma. He pleaded for a recognized standard of cure.

DR. F. ANTILL POCKLEY (Sydney) insisted that early trachoma was curable and that it was very slightly contagious; he had not found any new method of treatment and he had used the tarsectomy in persistent cases.

DR. A. M. MORGAN (Adelaide) ascribed the freedom of South Australia from trachoma to relatively good social conditions.

DR. J. LOCKHART GIBSON (Brisbane) stated that in Queensland they had done good work in preventing trachoma by the use of fly wire and the freer use of water.

DR. T. A. PRICE (Toowoomba) used solid carbon dioxide dissolved in ether and painted on with a brush. Medical men were sent into western districts of Queensland to educate the public on trachoma.

DR. W. W. HOARE (Brisbane) held that tarsectomy was of great help in selected cases and was in favour of extensive peritomy.

DR. GUY POCKLEY (Sydney) had used much carbon dioxide snow and found patients tolerated it much better on hot days.

DR. M. A. SCHALIT (Windsor) discussed treatment in the east.

DR. H. F. SHORNEY (Adelaide) pleaded for notification of trachoma and for the education of trachomatous children and for the better immigration selection.

Ocular Syphilis.

DR. J. LOCKHART GIBSON contended that the Wassermann reaction, while teaching much in regard to the results of treatment of syphilis, was less of an aid in eye work than in any other department of medicine. He held that this test had introduced an attitude of false security in the case of both doctor and patient and that patients showing tertiary manifestations in late middle life had probably fought primary and secondary infections by their own specially good tissue resistance. In this regard and in regard to the standard of cure he quoted the opinion of Buzzard and also referred to several cases which illustrated his contention.

DR. J. CAMPBELL DOUGLAS regarded the repeated failure to respond to the Wassermann test as a guide to treatment. He urged the use of the "sigma" reaction. He regarded a patient as cured if after two years the serum still failed to yield a reaction to the Wassermann test.

DR. F. ANTILL POCKLEY agreed that treatment by mercury was of very great value.

SIR JAMES BARRETT insisted that the Wassermann reaction had a definite diagnostic value. For accurate results to be obtained extreme care had to be taken; the pitfalls were so numerous. He doubted whether syphilis could ever be cured, except in its very earliest stages.

DR. D. D. PATON asked Dr. Lockhart Gibson whether he could state what proportion of patients yielded a Wassermann reaction and had at the same time definite signs of syphilitic eye lesions.

DR. LEONARD MITCHELL (Melbourne) pointed out that Boyd Graham had definitely reversed the Wassermann test when applied to persons with congenital syphilis.

Pseudo-Sympathetic Ophthalmia.

DR. J. LOCKHART GIBSON also discussed pseudo-sympathetic ophthalmia and quoted at length from the histories of two patients. He argued that the conditions could be explained by a serious injury to one eye or by a lowering of the general health, an impairment of the endocrine imbalance or the presence of a septic focus. Both his patients had been syphilitic. He asked if it were not possible that an injury to one eye without some such predisposing state would not result in sympathetic inflammation. He added some remarks on interstitial keratitis and recommended very thorough anti-syphilitic treatment for this condition.

SIR JAMES BARRETT had long been in the habit of examining the patient's history for venereal disease in all cases of supposed sympathetic ophthalmia.

DR. F. ANTILL POCKLEY had had very little experience of this disease. He related a case in which a piece of brass or copper had penetrated the eye. The medico-legal aspect had come up and some expert witnesses had contended that the removal of the eye was wrong treatment, whereas he (the speaker) had strongly urged that the eye should have been removed.

DR. A. M. MORGAN stated that all his patients at the Children's Hospital, Adelaide, with interstitial keratitis had yielded a reaction to the Wassermann test.

In reference to the medico-legal case mentioned by Dr. Pockley, DR. LOCKHART GIBSON reminded the members that at the Australasian Medical Congress, Brisbane, 1920, they had affirmed the advisability of removing such eyes.

Prevention of Myopia.

SIR JAMES BARRETT attacked the problem of the prevention of myopia by asserting that the disease was as serious in Australia as it was in other countries. He regarded over five diopters as a serious degree. Suitable desks, printing and lighting were essential. Maddox had said that it was not necessary to interrupt the education of children, but merely to alter it radically. In the "myope class" special oral treatment had been introduced and blackboards were used instead of pen and paper. He urged the Section to determine whether this problem should or should not be brought under the notice of the educational authorities in Australia. In conclusion he read an extract from one essay by Maddox written in 1884.

DR. F. A. NEWMAN (Melbourne) discussed the acquired form of axial myopia and reviewed the anatomical and physiological aspects. He laid especial emphasis on the contraction of the ciliary muscles and the *tensor chorioidæ* in drawing on the chorioid, in compressing the vitreous and in drawing forward the *venæ vorticosæ*, thus allowing more easy exit to the blood. This led to the enlargement of the suprachorioidal space, giving more room for the dilated blood vessels of the chorioid when the eye was accommodating. He suggested that the suspensory ligament was derived from a continuation inwards of the *lamina vitrea* and *ligamentum pectinatum* where they joined the ciliary body. He suggested that the primary lesion in myopia was in the elastic membrane of the chorioid, that the exciting cause was excessive accommodation and bad conditions of use and that the predisposing causes operating which interfered with nutrition, were due to heredity and to bad ante-natal conditions combined with bad feeding of the infant. He advocated a sound scheme of prophylaxis and treatment and emphasized the importance of the avoidance of near work.

A resolution with a view to the better education of myopes was unanimously adopted and forwarded to the Federal Committee.

DR. M. A. SCHALIT urged home hygiene and intelligent parental cooperation.

DR. J. R. MUIRHEAD (Adelaide) and DR. A. M. MORGAN agreed with Dr. Lindo Ferguson that in their areas there would be no call for special classes.

DR. PATON pleaded for myopic children and other children with defective sight and pointed out that corneal leucomata were often associated with secondary myopia.

DR. ANTILL POCKLEY pointed out that instructions given to parents were of necessity very rarely carried out and therefore special care of such children was necessary.

Arterio-Sclerosis.

DR. J. CAMPBELL DOUGLAS read a paper on the ophthalmic signs and symptoms of arterio-sclerosis. He followed Clifford Allbutt in regarding this condition as a lesion common to many diseases. He classified the cases as (i.) hyperpietic, (ii.) toxic and (iii.) senile and discussed the pathology and the diagnosis of the conditions and outlined the ophthalmoscopic findings. He concluded that this condition could be diagnosed more surely and earlier by the ophthalmologist than by anyone else, that the signs and symptoms apparent to the physician were late signs and symptoms and he therefore appealed for earlier reports from the ophthalmologist in order that the diagnosis could be confirmed and treatment undertaken with much better hope of success.

SIR JAMES BARRETT had not been able to convince himself that some of the fine ophthalmic changes described as pallor of fundus were not reliable. He regarded white effusions as of very great prognostic significance. He warned members that the absence of fundus findings does not exclude arterio-sclerosis.

DR. W. WALLIS HOARE regarded the varying size of the arteries as an important though late sign.

DR. J. LOCKHART GIBSON congratulated Dr. Douglas and emphasized the importance of the nipping of veins.

DR. LEONARD MITCHELL considered that the text-book descriptions of the fine early changes were, as a rule, not able to be demonstrated.

DR. D. D. PATON reminded members that photophobias and so forth often were associated with the general cerebral condition. He thought the "red free" light would be a great help.

DR. G. A. OWEN (Melbourne) reminded members that the Royal Society of Medicine had decided that the nipping of veins was the earliest and most dependable ophthalmic sign.

Renal Disease and Arterio-Sclerosis.

DR. LEONARD MITCHELL gave results of a clinical study of one hundred and ten cases of renal disease and arterio-sclerosis. The patients were all in-patients of the Melbourne Hospital and an extensive table showed the medical and eye findings. The series comprised eight cases of acute nephritis of which one showed a hæmorrhage and one papillœdema. Ten cases of subacute nephritis showed retinal œdema or hæmorrhages in five. Fifty-one cases of chronic nephritis were examined; the urea concentration was below normal in twenty-two. Fifteen showed arterio-sclerosis, twenty-five showed papillœdema, eighteen showed hæmorrhages and eighteen exudates. Of twenty-one cases of chronic nephritis with arterio-sclerosis there were eight with blood pressure over two hundred and all these latter showed marked retinal signs. The whole series gave retinal findings in 75.4%, which was much higher than most observers admitted. Twenty-eight patients had died.

SIR JAMES BARRETT congratulated Dr. Mitchell and agreed with the findings which were in accord with his experience. He failed to follow Moore in classifying the ophthalmic cases by retinal findings. He suggested the fuller application of money for research.

DR. J. LOCKHART GIBSON desired to examine the figures more closely. He urged the evacuation of the uterus as soon as eye signs appeared. He had known of one case only of a patient with retinal exudate.

DR. E. L. GAULT (Melbourne) classified cases: (1) toxic, (2) arterio-sclerotic.

DR. A. M. MORGAN quoted two cases of apparent albuminuric retinitis without albumin.

DR. J. CAMPBELL DOUGLAS asked if there were many cases of arterio-sclerosis without chronic nephritis.

DR. G. A. OWEN (Melbourne) asked whether it was posible to differentiate between a pure arterio-sclerosis and a renal retinitis. The importance as to prognosis was obvious and he quoted Gunn's patient who had lived for eleven years.

DR. D. D. PATON asked whether in the absence of white effusions it was possible to have any guide as to prognosis.

DR. LINDO FERGUSON (Dunedin) pointed out that Nettleship in dealing with white effusions, had extended his maximum period to five years.

DR. LEONARD MITCHELL replied to questions and thanked the Section for their kind remarks.

Causes of Blindness.

SIR JAMES BARRETT analysed the figures of the Victorian Royal Institute for the Blind. He concluded that the majority of cases of atrophy and chorioiditis were certainly due to syphilis, that the cases of *ophthalmia neonatorum* were due to gonorrhœa, that some of the cases of corneal ulceration were due to syphilis or gonorrhœa and that a small percentage of the cases of nystagmus, cataract, buphthalmos, degeneration of vitreous, keratoiritis was due to syphilis. He added that interstitial keratitis was definitely syphilitic. He showed that at least 50% of these affections were due to venereal disease notwithstanding the fact that very few of the patients manifested any of the usual signs of these diseases.

DR. E. L. GAULT invited the members to set up a standard of blindness or a definition of total blindness. He held that it was imperative that there should be an understanding in this regard between the medical profession and the insurance underwriters.

DR. D. D. PATON urged that medical practitioners in writing out certificates in compensation cases should state that the vision was so defective that the claimant was unable to follow any occupation requiring sight.

DR. J. LOCKHART GIBSON gave a résumé of the provisions of the *Workmen's Compensation Act* of Queensland.

DR. T. A. PRICE stated that the Queensland Government had taken a very liberal view in assessing compensation.

DR. D. D. PATON quoted some figures from Western Australia and pointed out that these figures coincided more or less with those of Sir James Barrett.

Accidents at Sea.

SIR JAMES BARRETT read a paper on the potential or actual accidents at sea that might be attributed to visual defects. He followed on the published work of Nettleship (1913) and quoted three cases in which visual defects though present were not found to have caused the accident. He contended that these cases provided powerful arguments in favour of a proper ophthalmological examination of boys before entering a marine career. He also urged that periodic examinations were usually essential.

DR. LEONARD MITCHELL pointed out that the dangers of tobacco amblyopia were very great. He held the opinion that when this condition occurred, the patient should give up the use of tobacco for the rest of his life.

DR. A. M. MORGAN related the case of a colour-blind engine driver.

DR. J. LOCKHART GIBSON urged the introduction of routine re-examinations of all transport men.

DR. D. D. PATON spoke of the importance of light minimum and light difference in the estimation of colour vision.

DR. J. R. MUIRHEAD (Adelaide) gave a short account of the history of a man who had night blindness and of a railway driver with bitemporal hemianopsia.

Strabismus.

DR. E. C. TEMPLE SMITH (Sydney), following up a previous paper of his own published in 1918, discussed strabismus. Confining his remarks to concomitant convergent squint, he outlined his own procedure which consisted in early operation, especially in the congenital type. The patients with recent strabismus he fully corrected, but if they were not improved, he operated on them after a year or so. In the amblyopic type he had had little benefit from the amblyoscope for training the fusion faculty. He regarded operation as the only treatment for the correction of the deformity; often, however, he tried correction for six months and combined with that the use of atropine in the fixing eye. He favoured Harman's reefing operation combined with "tenoplasty" of the internal rectus and counselled slight under-correction on the table. He used general anæsthesia in tiny children only.

DR. J. CAMPBELL DOUGLAS asked whether the advancing of a muscle on which tenoplasty had been performed, was satisfactory.

MR. EDWARD RYAN (Melbourne) practised muscle shortening and tenotomy. He held that many squints were rectified spontaneously. He did not think binocular vision was obtained in more than one of every hundred patients.

DR. W. WALLACE HOARE doubted the universal applicability of reefing.

DR. A. M. MORGAN advised early operation. He said that he had obtained good results with occlusion and poor results with atropine. He did not operate on children under fourteen years.

DR. J. LOCKHART GIBSON contended that squint treatment was extremely complicated. He gave his opinion that education of the cortex of the amblyopic eye was important. He regarded Ryan's methods as very sound.

DR. P. S. WEBSTER (Melbourne) had given up the amblyoscope. He had had difficulty with diplopia especially in adults when a squint had been corrected.

DR. LEONARD MITCHELL asked where the three cuts were made in the tenoplasty and whether he operated on both eyes at once.

DR. J. R. MUIRHEAD favoured advancement in tenotomy.

DR. PATON congratulated Dr. Smith on his results. He regarded the amblyopia as "ex-anopsia." He held that there was often binocular alignment. He urged the careful examination of both maculæ. He advised tenotomy of the internal rectus in all cases of congenital paresis.

SIR JAMES BARRETT related his experiments in support of Douglas's theory in amblyopia as to whether it was congenital. He held that failure to establish binocular fusion after operation entailed the essential weakness of the centre.

DR. TEMPLE SMITH replied that he did not expect to get binocular vision. He never operated on both eyes at once in any case.

SECTION VII.—OTOLOGY.

Rare Otological Conditions.

DR. T. S. KIRKLAND, the PRESIDENT of the Otological Section, said that in place of the usual address he would give the description of some rare and interesting cases that had come under his observation.

The first case was that of a man of middle age, who had a pedunculated growth on the posterior surface of soft palate. It had been removed with the snare. It had recurred some months later on the posterior pharyngeal wall as multiple round growths of various sizes. At the second operation he had split the cheek and had shelled out each growth separately. The pathologist had reported that it was sarcoma, but no recurrence had occurred.

A woman of middle-age had complained of a husky voice. The cords had been very broad and the epiglottis pale. The hands and feet had been enlarged. The exhibition of thyreoid extract had completely cured the condition.

A young woman had come under his care on account of pain in the larynx and hoarseness. Examination had revealed unilateral inflammation of the larynx. She had also complained of pains in the hand and elbow. Smears from the vagina had brought gonococci to light. The diagnosis was gonorrhœal arthritis.

A man, fifty-five years of age, had been subject to hæmoptysis for nine months. It had been thought that he had a cirrhotic liver. The attacks had been very frequent. Bronchoscopy had disclosed a small growth at the bifurcation. This growth had been removed by snares with difficulty. The pathological examination had shown that it was an angio-papilloma.

Other interesting cases of bilocular antrum, *pemphigus foliaceus*, naso-pharyngeal growth and a tumour of the carotid body were described.

DR. W. N. ROBERTSON (Brisbane) thanked the President and spoke of several cases of naso-pharyngeal growth and some interesting ear cases.

Naso-Pharyngeal Catarrh.

DR. R. H. PULLEINE (Adelaide) read a paper in which he spoke of the symptom of naso-pharyngeal catarrh being very largely a physiological reaction to a stimulus either local or general. He described the microscopical anatomy of the mucous membrane of the nose and emphasized the importance of the ciliated goblet cells and mucous glands and the rapidity of the action of the leucocytes. He dealt at length with different types of irritants, strongly condemning tobacco smoke and alcohol; dusty and humid climate was a very great causative factor. With regard to local causes he regarded a deviated septum and enlarged posterior ends of the turbinates as the chief causes of naso-pharyngeal catarrh with the exception of sinusitis. In regard to treatment he emphasized the necessity of doing as little as possible to the essential tissue of the nose. He preferred trichlor-acetic acid to other caustics, as in his opinion it caused less permanent damage. He strongly advocated the douche with Ringer's solution and lubrication with petrolatum. As an inhalation he used menthol and rectified spirit.

DR. T. S. KIRKLAND thanked Dr. Pulleine and said he did not believe in the douche.

DR. J. M. BAXTER (Melbourne) said he was very interested, but had had no success with any treatment.

DR. B. FOSTER (Melbourne) said he was disappointed that nothing had been said about vaccine. He thought that infection was the greatest factor and was very disappointed with autogenous vaccines in his own practice.

DR. RICHARD ARTHUR (Sydney) had had some success from cauterizing the interior turbinates.

DR. J. STODDART BARR (Hobart) said that he had found the climate of Tasmania bad for this condition.

DR. W. KENT HUGHES (Melbourne) deprecated consideration of catarrh as an entity. He regarded it a symptom of some other trouble, either in the nose or elsewhere, which should be treated in preference. All the methods mentioned could only be called palliative; he recommended thorough sinus investigation and treatment.

DR. G. HALLORAN (Sydney) expressed the opinion that the rhinologist, physiologist and bacteriologist should work together in the hunt for a specific organism.

DR. F. ANDREW (Melbourne) thought that no treatment was necessary if sinusitis and anaphylaxis were excluded. In anæmia detailed medical examination and treatment were indicated.

DR. H. S. MARSH (Sydney) thought there was a large nervous element.

DR. H. W. J. MARKS (Sydney) emphasized the possibility of myxœdema as a cause in some cases.

Enucleation of the Tonsil.

DR. R. H. PULLEINE described a method of enucleation in which a glass bulb was fitted to a suction apparatus. The tonsil was drawn into the glass bulb and snare applied. He dissected tonsils under local anæsthesia. He grasped the tonsil with bullet forceps and dissected with a curved separator and finished with a snare. He did not tie any vessels.

DR. J. H. O. MARTIN (Sydney) said that for some years he had used Waugh's method exclusively. He always used intratracheal anæsthesia and the suction apparatus by which he claimed that he could prevent pulmonary infection. He tied bleeding vessels and had not been troubled with hæmorrhage. He separated the posterior pillar first.

DR. H. B. GILL (Perth) said that he had seen Mr. Waugh stitch the pillars together after operation and he wanted to know the opinion about this procedure.

DR. GILBERT BROWN (Adelaide) said that in giving anæsthetic for tonsils he used a Shipway apparatus with a nasal tube. He held the opinion that vessels should always be tied.

DR. T. S. KIRKLAND perferred general anæsthesia; much of the separating was performed with his finger. He attributed scarring to imperfect incision at the start.

DR. H. S. MARSH preferred local anæsthesia in adults if the patient was suitable. He had found that women were better than men in this respect.

DR. B. SHORNEY (Adelaide) said that he used a Freer's septum knife to make the incision.

DR. G. HALLORAN wanted to know the opinion about tonsillectomy in singers. He had had no trouble. He had given up local anæsthesia because formerly it had led to too many reactionary hæmorrhages.

DR. F. ANDREW said that he always used intratracheal insufflation anæsthesia at a pressure sufficient to keep up a permanent expiratory blast. He used the Redpath method for all relatively easy operations. He claimed that it was less painful than other methods. In more difficult cases he dissected under local anæsthesia using a blunt pair of scissors. In the case of singers he packed the fossa with gauze soaked in Friar's balsam.

DR. J. M. BAXTER wished that men would be more frank about the question of hæmorrhage. He did have some trouble himself and would like to know the truth from others.

DR. W. KENT HUGHES protested against the old "atrocious" instruments still being exposed for sale. He himself used the guillotine as a grasping instrument and then proceeded to dissect with scissors. He had no trouble with hæmorrhage. He held the opinion that a crushing guillotine was unsurgical and had given up local anæsthesia on account of hæmorrhage.

DR. J. STODDART BARR asked whether a suction apparatus ever caused damage to the tissues. He was of the opinion that tissues should be handled very gently.

Tonsillitis.

DR. C. M. EADIE (Melbourne) then read a paper on the remote effects of tonsillitis. In this he first of all dealt with the anatomical position of the tonsil in the oropharynx where it was surrounded by muscles which had

a continual expression action, so that the débris and micro-organisms that collected in the crypts, were expressed and swallowed; retention was thus prevented. When the tonsillar crypts became occluded from any reason, retention resulted and septic cavities were formed. Toxins were absorbed into the lymphatic channels and blood stream. The crypts opening into the supra-tonsillar fossa were the most likely to be blocked. The very large and the very small tonsil were most likely to be affected. Dr. Eadie had carried out a research with Dr. J. R. Williams at the Melbourne Hospital. Forty-one patients suffering from some systemic infection had been dealt with. After tonsillectomy the tonsils had been placed in a sterile Petrie dish, a crypt collected and the exterior seared with a red-hot knife. A sterile platinum loop had then been introduced into the crypt and broth cultures and sub-cultures had been made. The result had shown that of forty-one patients hæmolytic streptococci had been found in thirty-three and non-hæmolytic in eight. *Streptococcus pyogenes* was found in 50% of the cases. Injection into guinea pigs showed that hæmolytic streptococci were not as virulent as the non-hæmolytic. He quoted Rosenow's work concerning the selective action by different strains. Many cases of bad taste in the mouth, bad breath and gastritis had been cured by tonsillectomy. Some cases of endocarditis had cleared up with amazing rapidity after tonsillectomy, as also had many cases of nervous debility, epilepsy, puerperal and many other systemic conditions.

DR. T. S. KIRKLAND spoke of the effects on the thyreoid enlargement of tonsillectomy. He had seen decrease many times.

DR. S. PERN (Melbourne) said that as a physician he came across many patients in whom he suspected the tonsils as septic foci. How was it possible to tell which was a septic tonsil? He saw many patients who had been greatly benefited by tonsillectomy, but had seen none who had suffered from the loss. He thought that even a small piece of infected tonsil might keep up thyreoid disease. He held that it was very necessary that the nasal sinuses should be investigated at the same time. He had seen several patients with epilepsy and acute nephritis cured by tonsillectomy. Lately in five patients with exophthalmic goître associated with sinusitis the condition had cleared up with intramuscular injections of "Collosal Manganese."

Intracranial Suppuration of Otitic Origin.

DR. FRANK ANDREW read a paper on intracranial suppuration of otitic origin and dealt with each intracranial lesion, taking them in anatomical order from without inwards. He said that he did not wish to go into the diagnosis of the conditions, as very little had been done in that direction since the work of the early investigators, such as Macewen, Ballance and others. He dealt first with extradural abscess. This occurred often and was often not diagnosed before operation. He urged free exposure of the *dura mater* in mastoid operation. If headache were present, this was especially necessary. Small dural exposure was a dangerous exposure. An extradural abscess very often simulated brain abscess and he mentioned three cases demonstrating this, in one of which hemiplegia and third nerve paralysis had been present.

With regard to lateral sinus thrombosis, he did not think that it was necessary to tie the jugular vein if bleeding occurred from both ends when the sinus was opened. He condemned the "washing through" of the upper segment of the jugular vein as a dangerous procedure. In regard to meningitis he dealt with the diffused and circumscribed types and urged colleagues not to be too despondent about the diffused variety, as meningismus, especially in children, might so closely simulate the purulent form, but often cleared up very quickly. He spoke briefly of the localized or circumscribed type.

In dealing with intra-cerebral abscesses, he called attention to three points in the operative treatment. The first was the necessity for avoidance of diffuse meningeal infection. The second was the necessity for avoidance of cerebral œdema. The third essential was to relieve bulbar compression.

With regard to the first the brain abcess should, if possible, be drained along the "stalk" which meant that a mastoid operation must precede. If a "stalk" could not be found, a flap of *dura mater* the size of a sixpenny piece could be turned down before the brain was exposed. If the condition did not demand immediate exploration, this step could be left for one to two days. This procedure, by allowing a small tight hernia to come down, was of value in shutting off the meningeal space.

To avoid cerebral œdema he always tried to prevent an abscess from evacuating suddenly. He used a rubber cone drain and allowed drainage to go on for days. To relieve bulbar compression, he removed bone freely, taking out the whole of the solid wedge between the *dura mater* of the middle and posterior fossæ and as much of the *tegmen tympani* and antra as could be done without interfering with the labyrinth. He claimed that owing to the elasticity of the anterior cerebellar *dura mater* this gave a very good decompression. He did not practise incision and drainage of the meninges.

Lumbar puncture he considered dangerous before and after operation in the majority of cases.

He maintained that the spread from labyrinthitis occurred commonly by two paths: (i.) along the eighth nerve and (ii.) along the *ductus endolymphaticus*.

He expressed himself as puzzled as to the course to pursue in cases of labyrinthitis occurring in acute *otitis media*. He gave notes of two cases of labyrinthitis and acute cases in which meningitis developed; both patients died. In one of them he had performed labyrinthectomy and the other he had not. He was of opinion that any labyrinthectomy should be very wide of the Neumann type.

DR. T. S. KIRKLAND said that he appreciated the paper and several points interested him, especially that of draining the abscess slowly. He had seen a patient die suddenly after evacuation.

DR. STODDART BARR gave details of the research he had carried out on cadavers of persons who had died from meningitis. He had performed lumbar puncture and inserted a cannula into the lateral ventricle. He had then forced in coloured fluids. The track had been examined afterwards and he had found that the fluid had passed through all parts of the cerebro-spinal fluid system. He had repeated the procedure in a patient with severe meningitis and had satisfied himself that the lavage was excellent, though the result in this case had been disappointing.

DR. S. A. EWING (Melbourne) agreed with Dr. Andrew in regard to cases of meningismus in children. He also agreed with the importance of finding an abscess "stalk." He mentioned several cases illustrating this point.

DR. J. T. MURPHY (Melbourne) showed two patients who had had cerebral abscesses and on whom he had successfully operated.

DR. R. S. GODSALL (Sydney) said that he did not think that sudden evacuation of an abscess was a danger.

DR. B. SHORNEY spoke of a patient with cerebral abscess who had died on the table, but no cause of death had been found.

DR. G. HALLORAN urged conservative treatment of the labyrinth. He did not believe in operative interference. He agreed with Dr. Andrew that most cases of extradural abscess could not be diagnosed before operation.

DR. H. W. J. MARKS advised immediate labyrinthectomy for intra-cranial suppuration occurring in the course of an acute *otitis media*. In intra-cranial suppuration occurring in the course of chronic *otitis media* the surgeon could wait. In dealing with sinus thrombosis he advocated excision of the jugular vein in the neck.

DR. F. ANDREW in reply emphasized his earlier points.

Sinusitis in Children.

DR. W. KENT HUGHES read a paper dealing with his results in twenty-seven children on whom he had operated at the Children's Hospital for sinusitis. The greater number of these children had been affected with the chronic or polypoid type of the disease. He deal with the historical side of the question. Woolf in 1895 had published

an account of *post mortem* examintions of the bodies of thirty-five children who had died of diphtheria, measles or scarlet fever. Of these the antra had been found to be polypoid in thirty. Pearce in 1899 had examined thirty-nine cadavers of children who had died of diphtheria. Twenty-five had revealed gross sinusitis, while the bacilli were recovered from the antra of thirty-six. In 1900 Harke and in 1914 Oppenheimer had reported similar researches with comparable figures.

He thought that sinusitis was an important factor in failure of cleft palate operations.

Symptoms were general in character, the chief among them being headache, constant colds, bronchitis, epistaxis and *otitis media*. He had not noticed anæmia as Clemison had done, though enlarged glands had been present in many of his patients. He had found that the maxillary antrum was the most frequently affected.

He did not use trans-illumination. X-rays, while of value at times, should not be allowed to stand in the way of operative treatment in the fact of clinical symptoms. The operation performed was the Caldwell-Luc. He made a small opening in the cannine fossa and a large opening in the antro-nasal wall, which he did not bring far forward. He was very careful to remove all the muco-periosteum. He did not use pre-operative irrigation as he thought Clemison's figures disappointing with this treatment. He also rarely used post-operative irrigation.

Of his twenty-seven patients, twelve had been cured, ten had been improved and were still improving and five were unchanged.

DR. H. J. GRAY (Perth) asked for opinion as to the efficacy of the intra-nasal operation. He preferred the Caldwell-Luc operation, even though in the presence of gross polypi ciliated epithelium remained.

DR. R. H. PULLEINE said he thought the subject very important. He used trans-illumination with a light attached to a spoon, so as not to frighten the child. In operating he did not remove the muco-periosteum as he thought that healing was delayed thereby.

DR. F. ANDREW said that he had seen many children in whom the condition had cleared up with one lavage. He believed that the ethmoid was always affected and was at a loss to deal with that condition in a child. He almost invariably performed the Caldwell-Luc operation and removed the muco-periosteum.

DR. W. N. ROBERTSON thought that whooping cough was the most frequent cause of sinusitis. He had seen the condition cleared up with one lavage on many occasions.

DR. H. B. GILL thought that sinuses were very largely infected after improper removal of adenoids.

DR. S. A. EWING pleaded for conservative treatment of the muco-periosteum. He had seen chronic purulent osteitis result.

DR. D. A. G. MCARTHUR (Melbourne) agreed that the whole muco-periosteum should be removed. On one occasion he had removed only that covering the floor, but later the remainder had to be removed.

DR. B. SHORNEY stated that while he was a student at Killian's clinic the teaching had been to remove the muco-periosteum.

DR. G. HALLORAN said that he refrained from doing the Caldwell-Luc operation for fear of damaging unerupted teeth.

DR. T. S. KIRKLAND was of the opinion that the muco-periosteum should be left, if possible. He advocated more lavage before radical operation was undertaken in a child.

DR. S. GODSALL read a paper on frontal sinusitis, in the course of which he described the radical operation with open treatment of the wound after operation. The method had originally been designed by Jansen. He claimed that less deformity, less osteomyelitis and better freedom from symptoms were secured than by other methods. He had an X-ray examination conducted before operation in order to acquaint himself with the anatomy. He used ether administered by the intratracheal method. He always packed the ethmoid with cocaine and adrenalin. He made the Killian incision taking the knife to the bone except at the pulley. The periosteum was stripped from the bone and the lachrymal sac was dislodged, but the pulley was disturbed only if this were absolutely necessary at a later stage. He opened the sinus below the supraorbital margin and mesial to the pulley. The floor was removed freely and a sufficient part of the anterior wall was taken away to render the removal of the whole muco-periosteum possible. He then passed a probe through the fronto-nasal duct. The naso-orbital wall was removed with a chisel, but care was taken not to work too far forward. The ethmoid was exenterated and if necessary the sphenoid. It was washed out with "Eusol" and packed with "Eusol" gauze. He emphasized the necessity of careful after treatment which consisted in repacking and allowing the cavity to granulate from below. Secondary suture was carried out in three to six weeks.

SIR WILLIAM MACEWEN (Glasgow) spoke of an interesting case in which polypi had extended to the frontal sinus from the sphenoid with large exposure of *dura mater*.

DR. W. KENT HUGHES criticized such free opening of the frontal nasal duct.

DR. STODDART BARR recognized the advantages of the operation in that it gave such good exposure of the ethmoid, but thought that it would be difficult to deal with upward and outward frontal extensions by this method.

DR. S. A. EWING appreciated the effort to prevent deformity. He did not believe in the intra-nasal operation.

DR. W. N. ROBERTSON said that he always carried out the intra-nasal operation first.

DR. T. S. KIRKLAND strongly emphasized the necessity of complete ethmoid exenteration.

Cauterization of the Nose.

DR. R. H. PULLEINE read a paper entitled: "Martyrdom of the Nose," in which he strongly condemned the cautery and other caustics with the exception of trichlor-acetic acid. He deplored the old practice of removing the inferior turbinate and said that he was a great advocate of submucus resection.

Lesions of the Static Labyrinth and Cerebellum.

PROFESSOR A. E. MILLS (Sydney) read a paper dealing with vertigo. He showed diagrams illustrating the tracts in the *pons Varolii*, cerebellum and mid-brain that were important in this connexion. He showed how the vestibular nerve was intimately connected with these tracts. Vertigo was a subjective symptom and was not dependent on the maintenance of equilibrium. Equilibrium was maintained by proper reaction to impulses from the ear, the eye, muscles, tendons and joints and the skin. The ear was the most important of these. Vertigo might occur alone or it might be associated with vomiting, nystagmus or falling. It was too often wrongly attributed to indigestion, weak heart and the like. He dealt at length with Ewald's classical experiment. If a labyrinth were normal, more than an ordinary stimulus was required to produce vertigo, but if the labyrinth were irritated, an ordinary movement of the head might provide it. This would account for the vertigo in alcoholism, tobacco smoking and other toxic states. In atheroma he believed that the labyrinth was hypersensitive. He quoted two cases in support of the view. Vertigo was common with high blood pressure. This he attributed not to the high pressure itself, but to the fact that diseased arteries produced anoxæmia.

DR. A. W. CAMPBELL (Sydney) read a paper entitled: "Evolution and Function of the Labyrinth." He pointed out that the labyrinth was of great antiquity and its function was always to combat gravity and inertia. He traced its development through lampreys, fishes and mammals. The otolith membrane was first in the fishes. In the human being it was very much elaborated, but still had the same function. He confirmed Professor Mills's statement that equilibrium was dependent on impulses from the ear, eye, muscles, joints and skin.

He described the cerebellum as the head ganglion of the reflex system, but doubted whether centres described

by Bárány in the cerebellar cortex really existed. He thought that it was more probable that impulses for concerted movements were centred together there.

DR. F. ANDREW pleaded that otological findings could only be subsidiary to those of the neurologist. He described in detail the tests done to investigate the function of the labyrinth. These were the rotation, caloric and the galvanic. He used only the caloric. He condemned the rotation test because too many stimuli were carried to both labyrinths and the results were too difficult to interpret. It also disturbed the patient too much.

He relied on the caloric test, syringing with cold water. This caused the eyes to be turned to the same side, caused the patient to fall to the same side and caused him to exhibit the phenomenon past-pointing to the same side with both arms. He did not think that past-pointing had any relation to vertigo. The eyes being drawn to the same side resulted in a nystagmus to the opposite side. If nystagmus were not threatened, lesion might be in the labyrinth, the nerve, the reception nucleus or in the posterior longitudinal bundle. If nystagmus were inverted, the lesion was probably in the *pons Varolii* or upper part of the *medulla oblongata*. Excessive nystagmus might be due to poor health, but an enduring nystagmus pointed to a destructive lesion of the homolateral cerebellar cortex or the homolateral dentate nucleus. Complete absence of past-pointing might be seen in gross homolateral cerebellar abscess, though absence in the opposite arm of past-pointing should not be regarded as of diagnostic importance. He referred to the danger of relying too much on the difference in reaction on the part of frontal and external canals, as his results showed that the frontal was usually the predominant canal.

PROFESSOR J. I. HUNTER (Sydney) said that the idea of anoxæmia occurring in the brain as the result of arterial disease could be readily understood in the light of recent researches.

Latent Mastoiditis.

DR. S. A. EWING read a paper on latent mastoiditis. He said it was usual to find suppuration of the mastoid antrum associated with inflammation in the tympanum, but it was very important to remember that the tympanum might not be infected although gross changes were present in the antrum and surrounding structures. He described the different types of mastoid process: (i.) the pneumatic, (ii.) the diploic and (iii.) the sclerotic. He thought that the condition was found most often in the sclerotic type. He had seen four patients who had had cerebral complications of suppurating antra and had died, but in whom no tympanic involvement had taken place at any time. As for treatment he believed in immediate operation as soon as the condition could be diagnosed. He emphasized the necessity of drainage. He proceeded to deal with some complications which were the same as those of ordinary *otitis media*. He had seen one remarkable case of an abscess of the cerebellum that pointed in the occipital region. He always tried to drain such an abscess from two points. He stated that he had been very fortunate in operating on brain abscesses as he had only lost one patient.

DR. G. C. SCANTLEBURY (Melbourne) congratulated Dr. Ewing on his success with brain abscesses. He thought that he was expressing the wishes of the Section when he urged Dr. Ewing to collect his cases and publish them in detail. Sir William Macewen's original series of cases consisted of nineteen with cure in eighteen. Since then no other worker could produce such good figures.

DR. R. H. PULLEINE spoke of the association of fifth nerve neuralgia and sixth nerve paralysis with latent mastoiditis. He had seen one case in which signs of thrombosis of the cavernous sinus had occurred with these complications. He believed that the œdema of the brain after evacuation of pus was due to impeded venous return.

DR. J. A. BISSET (Melbourne) had seen a case with signs suggesting lateral sinus thrombosis without the tympanum being involved.

DR. G. HALLORAN spoke of three cases of extensive mastoiditis and no tympanic signs.

DR. H. BARRY THOMSON (Melbourne) and DR. M. E. LYNCH (Melbourne) had also seen similar cases.

DR. F. ANDREW congratulated Dr. Ewing on his results in brain abscess operations. He too believed that cerebral œdema after brain abscess operation was due to limited venous return.

DR. T. S. KIRKLAND had seen cases of latent mastoiditis and found difficulty in deciding when to operate in the absence of changes in the posterior meatal wall.

DR. S. A. EWING in reply, referring to Dr. Pulleine's remarks, said that he had seen many cases of paresis of the sixth nerve. He did not consider it remarkable in view of the length of that nerve and the frequency of cell extension to the tip of the petrous bone.

MR. BRYAN FOSTER read a paper on mastoid drainage in early chronic *otitis media*. He began by referring to the difficulty felt by all otologists of deciding at what stage a patient with *otitis media* who had passed the acute stage, but whose ear was still discharging, should be operated upon. The two problems before them were: (i.) how to determine which cases would clear up and which would not and (ii.) how to deal with the latter. He thought that chronic *otitis media* could be divided into two classes: (i.) those confined to the atrium of the tympanum and (ii.) those involving mastoid cells as well. He quoted statistics of Turner and Fraser which showed that the Schwartze operation was a very successful one in all forms of the disease. Both Cheatle and Turner had demonstrated that the pneumatic type of mastoid process was present in 80% of Europeans and Dr. Foster thought that *otitis media* would probably not heal with conservative treatment when the patient possessed a mastoid process of the diploic or sclerotic types. For this reason if he found by X-ray examination that the mastoid process was acellular, he performed a Schwartze operation. He had operated on fourteen patients in the last two years with excellent results in twelve. In one of the remaining two patients the discharge persisted; the other had a dry perforation.

DR. T. S. KIRKLAND thought the anatomy of the attic very important as a cause of a disease becoming chronic.

DR. H. S. MARSH said he believed in the Schwartze operation in these cases.

DR. B. SHORNEY also spoke advocating early operation.

DR. R. S. GODSALL thought that Dr. Foster had given him an excellent point to work from. He considered the placing of suspicion on the acellular mastoid was very sound.

DR. G. C. SCANTLEBURY thanked Dr. Foster and expressed the opinion that his ideas were much sounder than those reported by Dr. Dan McKenzie who advocated operation at a very early stage.

A motion was put by DR. FRANK ANDREW, seconded by DR. R. GODSALL and resolved:

> That in the opinion of the Section the governing bodies of the Australian Universities be urged to grant to graduates in medicine and surgery a special diploma in oto-rhino-laryngology after appropriate examination; that such diploma is necessary and desirable in the interests of the public and of the profession.

SECTION VIII.—NEUROLOGY.

Speech Mechanism.

DR. S. V. SEWELL (Melbourne) read a paper on the evolution of the speech mechanism. He introduced his remarks by describing the building up of the brain from a primary smell brain to the intercalated mass round the auditory and visual stations. He pointed out that the developed brain consisted principally of projection centres. He indicated the appearance in carnivora of association areas; how in higher apes these had increased enormously and how with the formation of the upright posterior there was a further increase in association areas. He next

referred to the arrival of the supra-granular layer in mammals and indicated that the posterior association area did not change in dementia, whereas the frontal area did. He followed those who ascribed higher intellectual functions to the frontal lobes. In regard to the speech mechanism he indicated that this was common to all human beings from the gesture of the savage to modern man. He spoke of speech as a symbolic mechanism comparable in a way with that of the mathematician and the musician. He said that these symbols concerned in speech were learned by coordination of the auditory and the articulatory functions, the two afferent avenues being the articulo-auditory and the visual mechanisms. A word first seen was a sensory stimulus and words were gradually acquired. In the process of learning to read and write the cheirographic and the visual mechanisms were brought into play. These kept the thought mechanism supplied. Few people thought out a single proposition so as to be able to make coherent speech. The frontal bone was constantly dominating the speech mechanism; it gave man power to select suitable memorial images. In the evolution of the speech mechanism as a means for integrating thought he observed that the whole mental activity of the cortex was necessarily in use and any damage to any one part of this speech mechanism would produce some degree of intellectual defect. The main thesis was that speech was essentially an intellectual mechanism.

PROFESSOR J. I. HUNTER (Sydney) followed by saying that he agreed with the general principles enunciated by Dr. Sewell. He then drew attention to Head's conception of aphasia. Head's division clinically of aphasis into (i.) verbal, (ii.) syntactic, (iii.) nominal and (iv.) semantic and in the matter of localization pointed out that with the assistance of Professor Elliott Smith and by anatomical studies Dr. Head had attempted to localize the various clinical types above mentioned. Verbal aphasia was related to the inferior frontal zone; syntactic aphasia was related to the upper temporal zone; nominal aphasia was related to the pre-visual area of the cortex and semantic aphasia was related to the inferior parietal zone.

Measurements of endocranial casts according to Professor Hunter threw some light on the amount of speech possessed by prehistoric man in the terms of Head's localization. The Lake men of Java had not the ability to talk continuously, because the parietal zone was feebly developed. The inferior frontal zone was represented alike in man and in ape and probably represented the praxic centre for producing sound.

DR. R. R. STAWELL (Melbourne) made some brief remarks.

The Evolution of the Nervous System.

DR. W. COLIN MACKENZIE (Melbourne) gave a most excellent demonstration on the evolution of the nervous system with special reference to the Australian fauna, which forms a part of the extensive research which he has been carrying out on this subject. He began by demonstrating the origin of functions, pointing out that in the reptile there were two *corpora striata* and but one thalamus, amongst other things. He then described the origin of the callosal body and the fornix and fimbriæ and showed that the kangaroo, for instance, had no *callosum*, while the rabbit had. He emphasized the importance of the relation between brain structure and function, maintaining also that the dominating force in the developing of the brain and of higher intelligence rested on a muscular basis. He next indicated the difference between the brain of the slow moving blue-tongue lizard and the swift moving frilled lizard which in his words was just "getting off the ground" and was half-way between a reptile and a mammal. He next took up the genesis of the pyriform lobe and indicated that with its disappearance or atrophy the *corpus callosum* appeared. As the olfactory lobe atrophied, the necessity for a *corpus callosum* began and the formation of the callosum body was not a "leap" but a necessity. The *septum lucidum* only remained as part of the old olfactory area. In regard to the striate body sensory discrimination was a very old matter. Lastly Dr. W. Colin Mackenzie demonstrated how the thalamus impinged on the white substance in a limited manner or over a very limited area. He concluded by giving a fascinating cinematograph demonstration of the living platypus, pointing out various details in connexion therewith in the most striking manner.

DR. J. W. SPRINGTHORPE (Melbourne) and DR. J. DALE (Perth) made some remarks.

Feeble-mindedness.

PROFESSOR R. J. BERRY (Melbourne) read a paper illustrated by a beautiful series of lantern slides on the correlation of recent advances in cerebral structure and function with feeble-mindedness, and its diagnostic applicability. He opened with an account of the shorter neuronic arcs; he traced their development from the earthworm to man and indicated that it was to combinations of neurones that the psychologist looked for the physical basis of mind. He also compared the "smell brain" of primitive mammals with that of man, showing that man excelled in the possession of secondary association zones in which memory, reason, judgement, speech and so on arose and were carried on. These differences between man and the lower animals were reflected in the cerebral cortex. Next, referring particularly to the work of Bolton and Watson, he emphasized the importance of the division of the cerebral cortex, into infra- and supra-granular layers. He demonstrated the fact that in the lower animals the cortex consisted practically of infra-granular layers alone and that his part of the cortex was concerned with instinctive activities only (hunger and sex). Then in process of evolution the supra-granular cortex appeared and was concerned with higher intellectual functions, indeed was the basis of mind. He then illustrated comparative differences in the depth of the supra-granular cortex in the six months fœtus, still-born infant, normal adult and persons with amentia and dementia, showing most conclusively that this cortex which was the last to be evolved, was exactly that which underwent retrogressive changes in disease conditions, such as amentia and dementia. In fact this cortex varied in depth in proportion to the mental capacity of the individual. "Every individual begins life as an idiot and dies an idiot." Finally in the matter of diagnostic applicability he pointed out that in the estimation of mental deficiency, much skill and knowledge was required; not only was it necessary to carry out tests of the Binet-Simon kind, but to have a clinical and medical history of the person, a knowledge of the brain as displayed in Bolton's book and over and above this to carry out standardized tests of the receptor and effector machinery, anatomical head and body measurements and estimates of the cubic capacity of the cranium.

DR. J. W. SPRINGTHORPE, PROFESSOR J. I. HUNTER, DR. A. W. CAMPBELL and others discussed the paper.

DR. R. A. NOBLE (Sydney) in a paper on the detection and prevention of feeble-mindedness made a plea for numerous improvements in this connexion, namely the examination of alleged mental deficients by psychiatrists at Children's Courts, the provision of psychiatric clinics in connexion with the out-patients' departments of public hospitals, the introduction of social service activities, such as had proved their value in America, the intelligent use of segregation and the establishment of residential schools for the feeble-minded, in addition to the provision of special classes in day schools. He also touched upon the subject of sterilization of mental defectives and concluded by saying that the best way to deal with mental deficiency was to attack the matter at its source.

In the absence of DR. M. H. DOWNEY (Parkside), a paper by him on the subject of feeble-mindedness was read by the SECRETARY.

PROFESSOR SIR JOHN MACPHERSON (Sydney) read a paper of great interest on the legislative machinery for the care of the feeble-minded in Scotland. He first pointed out that although the *Mental Defectives Act* of Great Britain had come into force in the year 1913, it naturally had remained in a state of suspension during the war and on account

of financial stringency had not been effectively brought into operation yet.

The Scottish system differed essentially from the Australian in that it was one of local government, the county not the State was the unit of authority and the county was further subdivided into parish councils, of which there were from nine hundred to one thousand. The police constable acted *in loco parentis* to each individual who was unable to look after himself. Over all stood the board of control which, however, was not executive. Next, after deciding what was meant by feeble-mindedness, he indicated the responsible authorities for each case. They were: firstly, the parent or guardian and secondly, the local education authorities in the case of children between the ages of five and sixteen years. They were bound to discover and had no difficulty in doing so and in becoming acquainted with all children within their scope of responsibility. The education authorities, therefore, were the pivot of the whole concern, because no child escaped them. Finally, in the matter of the guardianship of defectives, he said they might be committed to a stranger who was responsible and who naturally was not chosen without care and who was subject to inspection. There was a general scheme for the periodical inspection of all defectives.

Venereal Disease and the Abnormal Mind.

DR. W. A. T. LIND (Kew) in his paper on venereal disease and the abnormal mind effectively covered all the ground dealing with the part that venereal disease played in the production not only of certifiable insanity but of the abnormal-minded in the general community and further with the part played by the abnormal mind in the propagation of venereal diseases. In regard to the latter he pointed out that persons affected with the higher grades of imbecility were largely responsible for the spread of venereal disease. He next indicated that gonorrhœa was a more important factor in the production of insanity than was generally supposed and amongst other points showed that gynæcological diseases were more prevalent in the insane than among the sane. Syphilis was, of course, the more important causative disease damaging the brain cells either directly or indirectly. Not only was it productive of general paralysis of the insane, but any individual having acquired syphilis, was carrying on at a disadvantage. A very important question was how much syphilis lay hidden in the community. Those with few initial signs of syphilitic infection often became general paralytics. The majority of patients with dementia supervening in early life were syphilitic. Figures were next given of the alarming percentage of syphilitic individuals apart from general paretics in the insane population and it was rightly maintained that the obvious keynote from the preventive standpoint was to endeavour by all possible means to reduce the spread of syphilis.

The paper was discussed by DR. RICHARD ARTHUR, SIR HENRY MAUDSLEY and DR. S. V. SEWELL and all agreed regarding the enormous economical gain to the country to be attained by lessening venereal disease and its subsequent appalling crop of insanity.

Sex and Psychosis.

DR. J. V. MCAREE (Adelaide) in a long and able paper on sex and its influence on the causation of psychosis covered a wide field of several perversions. He narrated important examples of this disorder which he had treated successfully by psycho-analysis and hypnosis and gave a psychological account of the subconscious state, the analysis of dreams, symbolisms and other psychological problems.

The discussion which followed, consisted mainly of attack and defence of Freudian doctrines concerning sex.

General Paralysis of the Insane.

DR. W. E. JONES (Melbourne) read a paper concerning general paralysis of the insane. He hinted that the type of general paralysis of the insane was changing. The melancholic was taking the place of the maniacal and the demented was still commoner. He also believed that he saw evidence of other factors assisting syphilis in the production of the disease and instanced the neuropathic disposition, alcoholism and mental stress and strain. He referred to the rise in incidence of general paralysis of the insane as an aftermath of the Napoleonic wars and likewise of the South African war and thought it likely that the great war would in due course produce its crop. It was possible, however, and certainly very earnestly to be hoped for that improved and more effective methods of treatment of syphilis obtaining at the time as compared with thirty years before would hold the disease in check. He concluded by giving figures illustrating the incidence of the disease in Australia.

SIR JOHN MACPHERSON, DRS. PHILPOT, NOBLE, LIND and SEWELL discussed the paper. Reference was made to blows on the head as precipitating general paralysis of the insane, to the virulence of the South African (Boer war) spirochæte and to the possibility of a special form of spirochæte as the causal agent. None of the speakers nor Dr. Jones himself could point to a patient with general paralysis of the insane which had been cured by the various forms of antispirochætal treatment recommended.

The Psychology of the Criminal.

DR. PAUL DANE (Melbourne) in a well-considered paper on the psychology of the criminal said that in the causation of crime there were two big factors. The first was mental deficiency. He thought that mentally defective delinquents should be segregated rather than imprisoned. The second and more important cause was "mental conflict" which was a feature in the life of all people and forced some into crime. This was aggravated by vicious and unnatural surroundings. Indeed mental conflict might actually be the cause of intellectual defect. The conflict was often of a sex character. He concluded by narrating cases of delinquency to illustrate that their disorder was mainly of a psycho-neurotic nature.

In the discussion which followed it was indicated by SIR JOHN MACPHERSON that while "conflict" might be the basis of much delinquency, it was also the basis of many other actions not necessarily delinquent. DR. ERNEST JONES emphasized the importance of a training in lunacy as part of the equipment of a prison medical officer.

Psychological Processes and Physiological Reflex Mechanisms.

SIR HENRY MAUDSLEY (Melbourne) read a paper on the relationship between psychological processes and physiological reflex mechanisms, which was described by the PRESIDENT as one of the most important delivered in this Section; it is, however, of a kind which does not lend itself to reproduction in abstract form.

Psychiatric Clinics.

DR. M. F. H. GAMBLE (Melbourne) read a paper on the psychiatric clinic, its policy and possibilities. He pointed out the numerous advantages of such a clinic, namely the recognition and treatment of mental disorders in its early stages, the recognition of borderland cases and of certificate cases, the saving of expense to mental hospitals and so on. He held that the ideal of the psychiatric clinic was prophylaxis.

Discussing the paper, DR. NOBLE expressed the opinion that of the various types of psychiatric clinic that in which there was accommodation for patients with neurological and for those with psychiatric affections, was the most desirable.

Stammering.

DR. T. GARNET LEARY (Melbourne) in a paper on stammering and its influence on education indicated the disadvantages under which the stammerer laboured while at school. Although stammerers on the whole were above the average in intellect, the attitude of the teacher towards him was one of contempt, whereas the proper thing was to inspire him with confidence and to extend sympathy. He concluded with a delightful demonstration of a series of boys and one girl, in whom his methods of treatment had been attended by striking success. The principles of the

method were (i.) to relax all muscles completely and (ii.) to perform a form of rhythmic movement of hand or foot or other part of the body, as well as by a sing-song intonation.

Psycho-Therapy.

DR. J. W. SPRINGTHORPE took for his subject psycho-therapy in practice and dealt with it at length.

Muscle Pressure Sense.

PROFESSOR CARNALT JONES (Dunedin) read a paper on the muscle pressure sense in neurological diagnosis. The muscle pressure sense was the sensation of pain detected in muscles, such as the pectoral or calf muscle, by picking them up and exerting firm pressure upon them. It was stated to be the most constant and reliable sign of *tabes dorsalis*. High lesions of the spinal cord and hysteria were the only other conditions in which he had noted loss of this sense.

Insanity in the Australian Aboriginal.

DR. J. BOSTOCK (Sydney) read a very important paper on the insanity in the Australian aboriginal and indicated a very early onset of dementia with tendency to motor activities and to visual rather than to auditory hallucinations. *Dementia precox* and manic depressive insanity occurred. Epilepsy was met with as were confusional insanity and alcoholic dementia in those exposed to alcohol. General paralysis of the insane was not infrequent. The psycho-neuroses and hysteria were not in evidence.

SECTION IX.—DISEASES OF CHILDREN.

Pyloric Stenosis.

DR. STEWART FERGUSON (Melbourne) read a paper opening a discussion on pyloric stenosis. He stated that he was in accord with Still in considering that every infant with chronic vomiting, constipation and failure to thrive should at least be suspected of having pyloric stenosis. With regard to the palpation of a tumour he considered that the administration of an anæsthetic was necessary. Patience was often required before peristalsis was seen. He depended mainly for the diagnosis on the barium meal and examination by X-rays. Seven cubic centimetres of barium sulphate were given and the length of time during which the barium remained in the stomach, helped to distinguish between an organic and spasmodic stenosis. Dr. Ferguson considered that if the barium remained in the stomach for over six hours, it was an indication of organic obstruction. The position and motility of the barium ball in the stomach was of importance. In children who required surgical treatment, the barium was more motile and appeared to pass from one side of the body to the other with gravity. When spasmodic obstruction was present, no such motility was seen. With regard to treatment, operation should be undertaken as soon as organic stenosis was diagnosed. In spasmodic obstruction some barium had passed at the end of six hours into the intestine. Dilation of the stomach was less and no tumour was felt. Infants with this type did well with medical treatment. In the matter of feeding Dr. Ferguson aimed at keeping the diet fluid in the stomach with low fat. He used whey, condensed milk and barley water. Regular hours of feeding were essential, small feedings being given every two or two and a half hours. He had had no good results with thickened cereal.

DR. R. M. DOWNES (Melbourne) emphasized the importance of remembering the possibility of pyloric stenosis in all cases of persistent vomiting. In his opinion a tumour must be felt in order to make an absolute diagnosis. An anæsthetic might be necessary and more than one examination might be required. He was in favour of surgical treatment as soon as the diagnosis was made. In recent years in the Melbourne Children's Hospital no medically treated infant had recovered. Rammstedt's operation was the most effective. The after treatment was important; warmth and avoidance of starvation were essential. Breast milk if possible was given. If the infant was artificially fed, condensed milk or equal parts of milk and water were the best food.

DR. T. E. GREEN (Bendigo) reported three cases of pyloric stenosis medically treated with recovery. Photographs of the infants showing definite peristalsis were exhibited together with weight charts. The treatment consisted of tincture of opium in doses of 0.004 mil before each feed.

DR. GILBERT BROWN (Adelaide) emphasized the dangers of anæsthesia during the operation on these infants. These babies died either because operation had been delayed too long or because of the length of time occupied by the operation or from the results of the anæsthetic. Dr. Brown gave atropine before every anæsthetic administered to children. The anæsthetic which he preferred, was ether given with Shipway's apparatus.

DR. H. GILBERT (Adelaide) regarded Rammstedt's operation as the best. In one case the infant had recurrence of symptoms after an apparently successful operation. The infant recovered under medical treatment.

DR. R. MACDONALD GILL (Sydney) recommended the use of atropine if it was decided to treat the infant medically. He used a one in one thousand solution and gave 0.06 mil to each bottle gradually increased until 0.9 or 1 mil was given in each feed.

DR. H. DOUGLAS STEPHENS (Melbourne) after having personally treated a number of infants with pyloric stenosis medically had become wholly in favour of surgical treatment. Medical treatment involved a constant strain over a long period of time and the results of surgical treatment were dramatic. It was not always possible to distinguish between those who would recover under medical treatment, and those who would require operation, so that less risk was run by adopting surgical treatment. Rammstedt's operation yielded excellent results. He did not think an X-ray examination was of much help.

DR. TRUBY KING (Wellington) agreed that operative treatment gave the best results. In the after treatment, if breast milk was not available, he recommended the use of humanized milk.

DR. R. B. WADE (Sydney) thanked Dr. Ferguson for his interesting paper. He did not think that in Australia they had such enormous differences between hospital patients and those seen in private practice as Still reported in his paper. Dr. Wade relied on the presence of peristaltic waves for diagnosis. In the majority of cases he had not felt a tumour. The amount of obstruction depended on the size of the tumour and the power of the stomach to force food through. He emphasized the fact that vomiting was the first symptom; this fact should be impressed on students. Later symptoms should not be waited for before appropriate treatment was undertaken. Once the diagnosis was made, operation should be carried out immediately.

DR. FERGUSON in reply said that breast milk was essentially a low protein food, cow's milk essentially a high protein food. They could not make the one resemble the other; there were too many differences between the protein and fat. He said that he could show chart after chart of infants fed on low protein diet who did not thrive. In his opinion, the essential principle in artificial feeding was the necessity for a high protein. He had seen the recurrence of symptoms in one child after operation. The skiagram had not revealed an obstruction and on careful dieting the child had recovered.

Treatment of Glandular Tuberculosis.

DR. R. M. DOWNES in opening the discussion on the treatment of glandular tuberculosis said that for some months owing to the kindness of his colleagues he had had entire charge of the patients with tuberculous cervical glands at the Children's Hosptial. The more frequent removal of tonsils was probably responsible for the decrease in number of patients with these conditions in recent years. The type of bacillus was frequently bovine. In 53% of the patients the affection occurred between the

ages of eleven and fifteen. This was the period of diseased tonsils and teeth. Tonsils were frequently tuberculous; not only did they harbour tubercle bacilli, but definite tubercular lesions were present. In 43% of Dr. Downes's patients tuberculous tonsils were present.

With regard to diagnosis the earlier it was made, the better were the results. Dr. Downes considered that abscess formation was often the first sign. He regarded every abscess of the cervical glands as possibly tuberculous. The von Pirquet test was useful as a diagnostic agent in infants to the age of six years. There were few children in whom cervical glands could be palpated. A child was brought because the cervical glands were palpable and there was a family history of tuberculous disease. The tonsils were removed and both were found to be tuberculous. It was often impossible to decide a diagnosis at once; it was necessary to wait and watch the progress.

The treatment of the condition consisted in general hygienic treatment, in the administration of tuberculin, in operation and X-ray therapy. With regard to surgical treatment primary excision should not be carried out except in the case of infants, unless the patient lived under good hygienic conditions and could be kept under observation. Caseating glands should be aspirated or incised and immediately closed. Heliotherapy was useful; tuberculin was also of value. Dr. Downes considered that X-ray treatment was effective in infants, but that in older children operation was to be preferred.

DR. F. GUY GRIFFITHS (Sydney) considered that tuberculous disease of the cervical glands was commonly of bovine origin. With regard to diagnosis he preferred subcutaneous injections of tuberculin to the von Pirquet test. He considered that to get a good focal reaction was an advantage. Tuberculous disease was never a surgical condition. The surgeon's work with regard to this disease should be confined to arranging splints and the like in treatment of bone conditions. He recommended large doses of tuberculin in treatment.

Dysentery in Children.

DR. MARJORY LITTLE (Sydney) in opening a discussion on the dysenteric conditions in children mentioned that between 1905 and 1914 Forsyth, of Melbourne, and Litchfield, Hipsley and Bradley, of Sydney, had reported the recovery of *Bacillus dysenteriæ* from the stools of children suffering from so-called summer diarrhœa. During the last three years experience gained during the war in diagnosis and treatment of bacillary dysentery had been applied to the civilian population and the definite statement could now be made that a large proportion of children suffering from diarrhœa with blood and mucus in the stools were suffering from bacillary dysentery. The recovery of the bacillus from the stools depended on three factors: (i.) on the period of the disease at which the examination of the stool was made, (ii.) on the amount of time allowed to elapse between the collection of the material and the examination and (iii.) on the selection of material for examination. The earlier in the disease the examination of the stool was made, the more likely was the bacillus to be recovered. The present investigation had been carried out at the Royal Alexandra Hospital, Sydney. Three groups of patients had been recognized. In the first group the patient was usually under twelve months old and had a history of chronic intestinal disturbance, with attacks of diarrhœa alternating with constipation. The stools were usually green and contained much mucus with abundant fæcal material and streaks of blood at times. From the stools of this group no pathogenic organisms were recovered. In the second group the patients were usually over six months of age. The child was acutely ill and passed large stools which were liquid and offensive and seldom contained blood. Pathogenic organisms other than the *Bacillus dysenteriæ* had been recovered from sixty-four children belonging to this group. Morgan's bacillus No. 1 and members of the Salmonella group were the commonest. In the third group the age of the patients ranged from three months to seven years. They were previously healthy and well-nourished children. The history of a sudden onset of diarrhœa, abdominal pain and tenesmus was obtained. The stools almost invariably contained blood and mucus with little fæcal material. *Bacilli dysenteriæ* were recovered from one hundred and seventeen patients belonging to this group.

The members of the Flexner-Y group had been recovered from eighty-six patients. Members of the Shiga group had been recovered from six patients. From these investigations it could be concluded that the presence of blood and mucus in the stools of children with diarrhœa should be regarded as a sign of infection with *Bacillus dysenteriæ* until proved otherwise. It was advisable to administer anti-dysenteric serum as early as possible in the course of the disease; a polyvalent serum should be used until the bacteriological examination had been made.

DR. R. WEBSTER (Melbourne) reported a series of sixty-six cases of dysenteric infection in children which had been subjected to rigorous bacteriological control. Fifty-seven of the patients had been infected with *Bacillus dysenteriæ* Flexner and nine with the Sonne bacillus. He gave tables showing the results of treatment with anti-dysenteric serum. Excluding the group of children over two years of age and considering all who had received the first injection later than the fifth day as non-serum treated, the results were as follows. When the serum had been given on or before the fifth day, the mortality was 55.5%. When the serum had been given later than the fifth day or withheld altogether, the mortality was 68%. The average quantity given had been one hundred and fifteen cubic centimetres; the usual dose injected had been from thirty to sixty cubic centimetres, the smallest dose had been twenty cubic centimetres and the largest dose two hundred and fifty cubic centimetres. The serum had been administered by the subcutaneous and intraperitoneal routes.

DR. F. H. BEARE (Adelaide) gave the results of work done during 1920 and 1922 for the Gastro-enteritis Research Committee of Adelaide. The type of infection in the majority had been the Flexner; no Shiga bacilli had been found. There had been no amœbic dysentery. He concluded that every case of diarrhœa characterized by blood and mucus was dysentery. In children under three months of age 10% of all attacks of diarrhœa were dysenteric; in those over one year 64% were dysenteric. The breast fed babies were less likely to be attacked than the artificially fed. As cow's milk was the most common infants' food, there were more children with dysentery fed on cows' milk than on other foods. Of those examined 61% had been shown to have been in contact with other children with dysentery. Horses and flies had been shown to play an important part in spreading infection. In several cases the patients had been in contact with carriers.

DR. STEWART FERGUSON emphasized the necessity for differentiating between the various forms of diarrhœa, such as dyspeptic diarrhœa, that due to excessive fat or sugar and acute infections. The treatment, he considered, should be directed to altering the flora of the intestine. In the cause of dysentery he recommended flooding the bowel with a carbo-hydrate medium, as the *Bacillus dysenteriæ* had been shown to produce less toxin in a carbohydrate than in a protein medium. He gave a 5% solution of lactose in barley water for twenty-four to forty-eight hours, then he added a small quantity of protein, fat being the last element to be added.

DR. H. DOUGLAS STEPHENS stated that he had seen very few children with diarrhœa due to gas-producing bacilli nor had he been successful in altering the intestinal flora by means of diet. He considered that the patients with dysentery should not be kept too long on a carbo-hydrate diet. After the first twenty-four to forty-eight hours, protein should be added.

DR. LITTLE in reply made a plea for further investigation into the results of serum treatment. The differentiation of the bacilli was only necessary if serum treatment was to be used.

Rickets.

DR. ELSIE DALYELL (Sydney) read a paper on rickets. She referred to the recent advances in the study of this disease in Europe and America and pointed out that the new principles of metabolism of calcium and phosphorus were likely to influence their ideas of nutrition in general. A definition of rickets was difficult as the disease was regarded as a metabolic disturbance of which damage to growing bones was only one feature. Estimation of concentration of calcium and phosphorus in blood was the best means of diagnosis of a rhachitic condition. The interaction of light with an organic dietetic factor regulated the growth of bone. The light rays occurring in the ultra-violet region of wave length about three hundred micro-millimetres had the specific property of stimulating calcium metabolism. When the rays were reduced in intensity, the defect could within limits be compensated by the addition of cod liver oil to the diet. Cod liver oil and the oils of other deep water fish were rich sources of the organic factors which could replace light; this factor occurred in much smaller amount in certain other fats. Application of these principles in Australia called for wide research. The criteria of rickets should be chemical, radiographic and histological and the normal level of calcium and phosphorus in Australia should be determined. The intensity of light should be studied and the extent and potency of ultra-violet radiation should be shown by animal experiment. The distribution of the organic factor in infant foods should be estimated and the relative amounts of calcium and phosphorus supplied in dietary should come under consideration.

DR. HELEN MAYO (Adelaide) had examined the records of the Adelaide Children's Hospital for cases of rickets in order to determine whether rickets occurred in Adelaide. If it did occur, it was essential to ascertain under what conditions and to what extent. In her series there were forty-five patients with rickets and there were twelve whose condition might be rickets. The twenty-three patients were between the ages of fifteen months and three years; they had definite bowing of the legs. Other patients were suffering from definite scurvy. She had found no craniotabes. Beaded ribs, delayed closure of the fontanelle, frontal bossing and thoracic deformities had been present. Town and country supplied about an equal number of these children. One was a child who had lived in a small house at Mount Lofty. The house had no verandah, so that it was assumed that during the usual wet and cold winter the child had remained indoors for the greater part of the time. She concluded that rickets occurred, but that it was impossible, from her investigations, to say to what extent. It was rare to find severe rickets.

DR. HARVEY SUTTON (Sydney) said that the application of Dr. Dalyell's work left them in doubt from the point of view of preventive medicine. In a series of school children examined in Victoria, 20% had shown signs of rickets. No seasonal incidence had been evident. Only 10% of children breast fed to six months had shown signs of rickets and these had been very slight. He found it difficult to believe that deficiency of sunlight was a cause in Australia, but considered that the cause must be a dietetic one.

DR. J. B. D. GALBRAITH (Melbourne) stated that he had worked in Glasgow with Dr. Leonard Findlay. In a series of sixty-three out-patient infants fed with sufficient fat 77% had developed rickets during the winter; of eighteen breast fed babies fifteen had developed rickets during the winter. In summer very few had shown signs of the disease. He showed a chart illustrating the seasonal incidence and types of rickets.

DR. MARGARET HARPER (Sydney) had investigated a series of one hundred and eleven infants between the ages of one month and two years. Of these fourteen or 12.3% had shown definite signs of rickets. Thirty-nine infants under six months of age had been examined and of these two had shown signs of rickets. Both had been four months old. It was stated that many of these infants had remained out of doors nearly all day. The diets of the rhachitic infants had been as follows. Dried milk was the diet of nine babies, sweetened condensed milk of three, fresh cow's milk diluted with biscuit added of one, humanized milk with New Zealand emulsion of one. Four of the infants had suffered from intestinal disease. The diet of the ninety-seven infants who had shown no rickets, had been as follows. Entirely breast fed sixty-nine, dried milk twenty-two (three with the addition of cod liver oil), condensed milk four, fresh cow's milk two.

DR. TRUBY KING mentioned that in America the majority of black infants showed rickets although breast fed.

DR. R. B. WADE hoped that Dr. Dalyell would continue her research in Australia. He asked if pigmentation of the skin influenced the occurrence of rickets.

DR. DALYELL in reply said that pigmentation of the skin was an important factor. Black rats required larger doses of ultra-violet rays to protect them from or to cure rickets than white rats. The condition of the mother during pregnancy was important. Mothers with osteomalacia produced infants with rickets. Good nutrition was essential in regard to the prevention of diarrhœa.

Diarrhœal Diseases.

DR. TRUBY KING traced the steps which had been successful in reducing the death rate from diarrhœal diseases in New Zealand. Sixteen years before the Plunkett Society had been formed for the dissemination of knowledge with regard to the care of the infant. In 1907 the deaths from diarrhœal diseases in Dunedin had been twenty-five per one thousand infants. A gradual reduction had taken place until for the past two years there had been no death in Dunedin from these diseases. He stated that gastro-enteritis had been wiped out by treating the mother as the person on whom the life of the infant depended. The establishment and maintenance of good nutrition was the most important factor. He showed a health weight-foot chart used in the teaching of medical students and of nurses. The diminution in the mortality rate during the first month of life had been effected by these methods. He emphasized the importance of breast feeding. If this was impossible a food approaching human milk as nearly as possible should be used, that was humanized milk.

Congenital Syphilis.

DR. BOYD GRAHAM (Melbourne) in opening the discussion on congenital syphilis said that when due care was exercised to establish the diagnosis before the initiation of treatment in order to obviate injustice to the patient, treatment by means of "Neo-arseno-billion," preferably by the intravenous route, had proved very satisfactory in the first year or two of life. It had proved very disappointing in the later years of childhood. A diminishing response to the complement fixation test after injection had been noticed. It was not necessary to continue the injections until the serum failed to react. Deep subcutaneous injection had been used until recently when the percutaneous-intravenous method had been adopted. In subcutaneous injection the site chosen had been a point under the ileo-tibial tract of the *fascia lata*. In this situation there was a potential space and Dr. Graham aimed at introducing the drug into it. Movements of the leg hastened absorption. In regard to intravenous injection the sinus, jugular and scalp veins had been discarded to a large extent. Dr. Graham had used "Galyl" in glucose solution for babies. Ten injections were given, but these had not proved so efficacious. The doses were relatively large. In young babies he had given twenty-eight centigrammes and in older children thirty-six centigrammes. Six injections had usually been given to each patient with weekly intervals. At the end of six weeks the reaction to the serum had usually been manifest, but without further treatment the reactivity had disappeared in about three months. Dr. Graham did not consider that mercurial treatment was of any avail. He showed charts illustrating the progress under treatment. The mothers had received injections of "Neo-arseno-billon" during the lactation period whenever this was possible. He maintained that ante-natal treatment was most important. No infant

had manifested signs of syphilis when the mother had been effectively treated during pregnancy. In the diagnosis ophthalmological examination was often helpful. The wastage of life caused by congenital syphilis was very great. The loss of life during pregnancy and childhood amounted to about 42% of the born and unborn infants of syphilitic parents and about one-half of this loss was due to syphilis and was preventible. Still-births, deaths in the first month of life and deaths in childhood should suggest a thorough serological examination of the children and of the parents. Still-births occurred four times as often in syphilitic families as in normal families. Dr. Graham said that it should be their aim to assist the legislators to devise a scheme for the early diagnosis and thorough treatment of all the affected people in the families that were known to contain at least one syphilitic. He recommended that serological examination of collaterals of known congenitally syphilitic persons should be made compulsory with a view to treatment of those affected.

DR. J. B. D. GALBRAITH said that in his work in Glasgow with Dr. Findlay he had used "Salvarsan" and "Neokharsivan," but the results were not so good as those reported by Dr. Graham. He said that sometimes fourteen injections were necessary before the serum lost its power of reacting to the Wassermann test. In patients over two years only 20% failed to respond to the test after fourteen injections. In those over the age of four years it was difficult to influence the serum in regard to its power to yield a Wassermann reaction and it was doubtful if continued treatment was worth while as the power to react disappeared within three months without more injections. He would give a course of an arsenical compound each year for three or four years. With regard to ante-natal treatment he said that it was impossible to obtain 100% healthy babies.

DR. E. H. MOLESWORTH (Sydney) had charge of a small number of infants and expectant mothers at the Royal Prince Alfred Hospital, Sydney. He had not used such large doses in babies as Dr. Graham used, but he would institute the larger doses on his return to Sydney. He agreed that mercurial treatment was not of much assistance. He emphasized the success of ante-natal treatment and laid stress on the importance of the early exhibition of the arsenical preparations in treatment of congenitally syphilitic babies; no baby was saved by mercury. In those cases of infants and mothers whose blood serum persistently yielded a Wassermann reaction, he had found the use of the new bismuth preparations of great use. They had reduced the power to react in almost every case.

DR. HARVEY SUTTON (Sydney) was anxious to get information with regard to the infectivity of congenital syphilis. He asked if there were any data with reference to the length of time congenital syphilis was infectious. He asked for criteria on which a clinical diagnosis of congenital syphilis could be made. He asked whether the children who were badly nourished, were subject to infections and whether children who were not thriving, were victims of congenital syphilitis.

DR. H. D. STEPHENS (Melbourne) reported two cases in which the arsenical preparation had been followed by interstitial keratitis in one child and syphilitic synovitis in another. He mentioned the case of a boy who at the age of five years had had a syphilitic synovitis; his mother had refused treatment. The child had been seen again at the age of twelve years and he had then been a moral imbecile. He said that it was very difficult to prove transmission of syphilis to the third generation. He suggested that Mongolian idiocy, hare-lip and cleft palate could be instances.

DR. A. P. DURHAM (Melbourne) recounted his experience at the Foundling Hospital. Those children who gave a Wassermann reaction, were placed under the care of Dr. Johnson who treated them with "Trêpol."

DR. B. GRAHAM in reply said that infants born with signs of syphilis were usually born dead. The earlier the lesions appeared, the less likely was the patient to survive. Symptoms usually appeared in from two to three and a half months. He thought that unless there was an open lesion, such as mucous patches, there was no infectivity. He suggested that an indefinite mucocutaneous margin at the corner of the mouth, eye margins and nasal margins might be regarded as a reliable sign of syphilis. These children were liable to infection. Repeated attacks of pneumonia were very suggestive of syphilis. Deafness was not common in children under fourteen years of age. The occurrence of epilepsy was suggestive of the effect of syphilis in the third generation.

A summary of the discussions in the remaining Sections and of the other proceedings of Congress will be published in next week's issue.

Corrigendum.

DR. S. HARRY HARRIS has called our attention to two errors in the summary of his paper on prostatectomy read during a session of the Section of Surgery of the Australasian Medical Congress (British Medical Association) as published in last week's issue (page 604). In the following sentences:

> If pus were present after sixteen or eighteen days the bladder should be irrigated with plain water, followed by installation of from ninety to one hundred and twenty cubic centimetres of a 1‰ silver nitrate solution and retained for four hours. Dr. Harris insisted on careful irrigation of the urethra with a 0.2% solution of oxycyanide of mercury before catheterization.

The strength of the silver nitrate solution should have been 0.3‰ (one part in three thousand parts) and that of the oxy-cyanide 0.2‰ (one part in five thousand parts).

In connexion with his remarks on renal insufficiency he wishes us to point out that he was referring to deaths from uræmia when he stated that he had lost only two patients on whose upper urinary tract he had operated during the past ten years.

THE PRICE OF "INSULIN."

WE have been authorized to state that the price of "Insulin" issued from the Commonwealth Serum Laboratories has been reduced by a further 33.3%, thus bringing the cost to two pence per clinical unit. A discount of 10% in addition to this reduction is allowed to all hospitals.

Naval and Military.

APPOINTMENTS.

THE following appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Nos. 70, 75 and 77, of October 11 and 25 and November 1, 1923.

Permanent Naval Forces of the Commonwealth.

Sea-Going Forces.

Transfer to Retired List.—SURGEON LIEUTENANT-COMMANDER VIVIAN RAMSAY-SMITH is transferred to the Retired List, dated 23rd August, 1923.

Transfer to Retired List.—SURGEON-LIEUTENANT GUY AUSTIN LENDEN, M.D., M.R.C.P., is transferred to the Retired List, dated 10th November, 1919 (that portion of Executive Minute No. 1/1920—notice of which appeared on page 33 of the *Commonwealth Gazette*, No. 4, of 15th January, 1920—relating to the termination of appointment of this officer, is hereby cancelled).

Royal Australian Air Force.

Permanent Commissions, "G" List.

To be Flight Lieutenant (Medical Services).—ARTHUR POOLE LAWRENCE, M.C., 31st March, 1921.

Short Service Commissions (Four Years), "G" List.

To be Flight Lieutenant (Medical Services).—GEORGE FREDERICK CHERRY, 1st September, 1921.

Australian Military Forces.

FIRST MILITARY DISTRICT.

Reserve of Officers.—CAPTAIN H. DOLMAN is transferred from the Reserve of Officers, 2nd Military District, 1st October, 1923.

SECOND MILITARY DISTRICT.

Reserve of Officers.

CAPTAIN J. G. M. BEALE is placed on the Retired List, with permission to retain his rank and wear the prescribed uniform, 15th September, 1923; CAPTAIN E. H. MOLESWORTH is retired under the provisions of Australian Military Regulation 147 (3), 16th September, 1923.

Australian Army Medical Corps.

To be Lieutenant (provisionally).—KINGSLEY DIXON HUDSON, 1st October, 1923.

Award of the Colonial Auxiliary Forces Officers' Decoration.

Retired List.—COLONEL T. M. MARTIN, C.M.G.

THIRD MILITARY DISTRICT.

Australian Army Medical Corps.

To be Captains (provisionally).—LIEUTENANTS R. SOUTHBY and ISAAC VALVL YOFFA, 1st July, 1923; the provisional rank of Lieutenant granted to ISAAC VALVL YOFFA is terminated, 30th June, 1923; MAJOR F. E. KEANE is appointed to command the 6th Field Ambulance, 1st July, 1923.

CAPTAIN F. W. FAY, M.C., is transferred to the Reserve of Officers, 6th Military District, 10th September, 1923.

To be Lieutenant (provisionally).—HEDLEY FRANK SUMMONS, 10th September, 1923; CAPTAIN M. W. CAVE, D.S.O., is transferred to the Reserve of Officers, and to be Major, 1st September, 1923.

Australian Army Medical Corps Reserve.

To be Honorary Captain.—AUSTIN DONALDSON CUST, 30th September, 1923.

HONORARY MAJOR J. E. NIHILL is retired under the provisions of Australian Military Regulation 152 (1), 29th September, 1923.

FIFTH MILITARY DISTRICT.

Australian Army Medical Corps.

CAPTAIN D. I. R. SMITH is transferred to the Reserve of Officers, 1st September, 1923.

SIXTH MILITARY DISTRICT.

Reserve of Officers.—CAPTAIN F. W. FAY, M.C., is transferred from the Reserve of Officers, 3rd Military District, 10th September, 1923.

Medical Appointments.

DR. F. O. STOKES (B.M.A.) has been appointed a Deputy Licensing Magistrate of the Licensing Court for the Licensing District of Manning River, New South Wales.

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DR. W. T. DERMER (B.M.A.) has been appointed District Medical Officer and Public Vaccinator at Quairading, Western Australia.

* * * *

DR. A. R. HOME (B.M.A.) has been appointed Deputy Quarantine Officer at Albany, Western Australia.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

ALFRED HOSPITAL, MELBOURNE: Vacancies on the Honorary Medical Staff.

UNIVERSITY OF THE WITWATERSRAND, SOUTH AFRICA: Lecturer in the Department of Anatomy.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Society's Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phœnix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, Saint George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

DEC. 18.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.
DEC. 19.—Victorian Branch, B.M.A.: Council.
DEC. 20.—City Medical Association: New South Wales.
DEC. 27.—South Australian Branch, B.M.A.: Branch.
DEC. 27.—Brisbane Hospital for Sick Children: Clinical Meeting.
DEC. 28.—Queensland Branch, B.M.A.: Council.
1924.
JAN. 11.—South Australian Branch, B.M.A.: Council.
FEB. 8.—South Australian Branch, B.M.A.: Council.
FEB. 28.—South Australian Branch, B.M.A.: Scientific Meeting.
MAR. 14.—South Australian Branch, B.M.A.: Council.
MAR. 27.—South Australian Branch, B.M.A.: Scientific Meeting.

Editorial Notices.

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